

**Traffic Impact Analysis
For
Coastal Christian School
San Luis Obispo County**

**PREPARED FOR
Coastal Christian School
1220 Farroll Road
Arroyo Grande, CA**

**PREPARED BY
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INTRODUCTION

The following traffic impact study was prepared to address the potential traffic impacts of the proposed Coastal Christian School (CCS) located northerly of the City of Pismo Beach and westerly of the City of Arroyo Grande in the County of San Luis Obispo. The school project was evaluated at a programmatic level in the Los Robles Del Mar project in 2001-2003. At this time, CCS is proposing a specific master plan of development for the school site. The County of San Luis Obispo Public Works Department reviewed and approved the scope of work for this traffic study including: the requirement for updated traffic counts, and analysis of intersections immediately adjacent to the project site and road segments. The revisions in this April 2009 update include responses to comments from Caltrans and other local agencies to expand the study to include the Highway 101 ramps at Oak Park Boulevard, access changes and level of service calculation methodology.

PROJECT DESCRIPTION

The planned school site is located westerly of Oak Park Boulevard between Meadowlark Drive and James Way. At this time, the school master plan will likely be developed over eight phases as specific needs and funding allows. The existing K-12 school will be relocated to the project site during the first phase of the project. Subsequent phases will add various classrooms, gymnasium, chapel, labs, industrial tech shops, playfields and other ancillary uses.

The main access to the school was planned to be located via a new roadway intersection mid-way between Meadowlark Drive and James Way. The County Public Works Department and City of Arroyo Grande requested that the main access be relocated to the north to intersect Meadowlark Road where the main Los Robles Del Mar (LRDM) project entrance was planned. The school is in the process of obtaining an easement over the LRDM property to connect the project site with the future intersection. The extension of Meadowlark Drive northwesterly was planned with the Las Robles Del Mar project. At this time, the project will construct a portion of the extension of Meadowlark Road. Once the Los Robles Del Mar project is constructed, the project would connect to the internal street system originally proposed by that project. The other access planned to connect to Oak Park Boulevard would provide a secondary vehicular exit and emergency access/egress for the project site.

Frontage improvements along Oak Park Boulevard to provide curbing and a center turn lane near the project access at Meadowlark Road will be constructed with the project. The project phasing is detailed in Table 1 and depicted graphically on Exhibit 1.

EXISTING CONDITIONS

Currently, the road network that serves the School consists primarily of Oak Park Boulevard. Due to the School's draw of students from around the Five Cities Area, other roadways are utilized to access Oak Park Boulevard including: James Way, W. Branch Street and Highway 101. The County indicated that due to the anticipated size of the school, that the study area for this report includes an analysis of Oak Park Boulevard between James Way and Meadowlark Drive and AM/PM peak hour analysis of the intersections of Oak Park Boulevard at James Way and at Meadowlark Drive. Caltrans requested to expand the study area to include the W. Branch Street/NB 101 ramps and El Camino Real intersections.

Oak Park Boulevard connects Highway 101 with Noyes Road in the foothills to the northeast of the project. Near Highway 101, Oak Park Boulevard is four lanes wide with traffic signals controlling the rights-of-way at the El Camino Real, W. Branch Street and James Way intersections. To the north of James Way, Oak Park Boulevard narrows to one lane in each direction. The intersection with Meadowlark Drive is STOP controlled on the side street only. The posted speed limit is 45 MPH.

Table 1
Development Phasing for Coastal Christian School

Phase 1 - Elementary 200 Students

Administration Office
Teachers Lounge
Elementary School (12 Classrooms)
Library/Computer Lab
Equipment Storage
Restrooms
Kindergarten (3 Classrooms)

Phase 2 - No Additional Students

Auditorium (435 person capacity)
Choir/Band Room
Kitchen/Indoor Dining
Outdoor Dining

Phase 3 - Jr. High and High School (400 additional students)

Administration offices for High School
High Tech Science Lab
High School Classrooms (8 rooms)
High School Library
Jr. High Classrooms (4 rooms)

Phase 4 - Industrial Arts (no additional students)

Industrial Arts Building

Phase 5 - Gymnasium (no additional students)

Gym lockers
Gymnasium
Pool

Phase 6 - Retreat Area (no additional students)

Retreat Rooms (2 rooms)
Memorial Garden Area

Phase 7 - Ball Fields (no additional students)

Football/Soccer/Softball Fields

Phase 8 - Chapel (no additional students)

Chapel/performing arts building (366 person capacity)

William R. Dyer
CIAI Engineering

PRELIMINARY GRADING & DRAINAGE PLAN
Coastal Commission Sheet
705 Oak Park Blvd., Suite 600
Palo Alto, CA 94303
Phone: (415) 362-1133
Fax: (415) 362-1134

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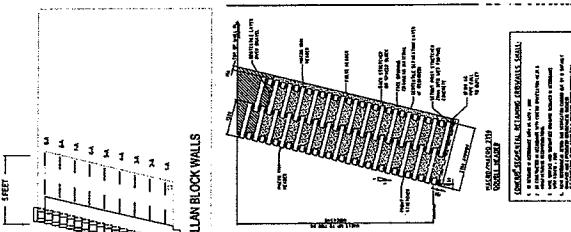
PARTITION SEPARATE	
Name of F.R.	44-10157
S.I. Name of F.R.	51-15457
Area of Detention	67A 5457
Code of Reference	2,461,57
Constituent	10 %
Comments	64-10157 111-57 Red Report (Elgin)

NON-REFUNDABLE EASEMENTS
APPELLE EASEMENT PER 11 OR 149
OR APPELLE EASEMENT PER 738 FOR 304 FEET ON PCL B OF 20 PM 15.
NOT ON PCL C1



116

(Note: ELEVATION ARE FROZEN SURFACE UNLESS OTHERWISE



James Way is a regional connector roadway between Pismo Beach and Arroyo Grande northerly of Highway 101. Generally, one travel lane with bike lanes is provided in each direction. STOP signs control vehicular rights-of-way at most intersections. In the vicinity of the project, the only signalized intersection is located at Oak Park Boulevard.

Meadowlark Drive is located just north of the project and functions as a residential collector street. The Los Robles Del Mar project and main school access would form a fourth leg of this intersection.

Traffic counts were collected in early June 2008, while area schools were still in session, for this project during the AM (7-9 AM) and PM (4-6 PM) peak hours at the two study area intersections. Roadway segment counts were also collected at the same time. For the expanded study area intersections requested by Caltrans, historical volumes from recent traffic studies in the area were used for the intersections of Oak Park Boulevard at W. Branch Street / NB 101 ramps and at the intersection of El Camino Real.

The average daily traffic (ADT) for Oak Park Boulevard north of James Way was found to be 4,701 vehicles per day. The capacity of a divided two lane roadway is in the 10,000 – 15,000 ADT range depending on roadway and other factors. In this location, the roadway operation is still very good with no congestion being experienced on a daily basis.

Local agencies have used a variety of intersection capacity evaluation techniques. Caltrans and the County of San Luis Obispo are currently using the Highway Capacity Manual (HCM) procedures. This procedure provides a measurement of vehicular delay per vehicle using the intersection. These delay measurements for unsignalized intersections range from 0 to 10.0 seconds for LOS A, 10.1 to 15.0 seconds LOS B, 15.1 – 25.0 seconds LOS C, 25.1 – 35.0 seconds LOS D, 35.1 – 50.0 seconds LOS E, more than 50.1 seconds LOS F. These delay measurements for signalized intersections range from 0 to 10.0 seconds for LOS A, 10.1 to 20.0 seconds LOS B, 20.1 – 35.0 seconds LOS C, 35.1 – 55.0 seconds LOS D, 55.1 – 65.0 seconds LOS E, more than 50.1 seconds LOS F. The County also utilizes level of service C or LOS C, as a goal level of service for county roadway intersections. Caltrans has the same goal, but will accept a lower level LOS D value (closer to LOS C than to LOS E, 45.0 seconds of delay) at freeway ramp connections.

Using this methodology, the existing intersection levels of service for the study area intersections were calculated. The results of these calculations are summarized in Table 2. The peak hour traffic counts, daily traffic volumes, and intersection calculation worksheets can be found in the appendix to this report.

Table 2
Existing Intersection Level of Service
AM and PM Peak Hours

Location	AM Peak Hour	PM Peak Hour
Oak Park Boulevard at		
El Camino Real	32.4 sec delay / LOS C	34.1 sec delay / LOS C
W. Branch/NB 101 Ramp	17.4 sec delay / LOS B	22.1 sec delay / LOS C
James Way	13.5 sec delay / LOS B	14.2 sec delay / LOS B
Meadowlark Drive	1.0 sec delay / LOS A	0.6 sec delay / LOS A

As seen in this table, all of the study area intersections currently operate within acceptable levels of service, LOS C or better.

PROJECT TRAFFIC

Trip Generation and Distribution

To estimate the traffic generated by the project, the trip generation rates published by the Institute of Transportation Engineers (ITE) in Trip Generation: An informational report, Eighth Edition were used. The land use code most closely related to the project is Code 536 – Private School K-12. The trip generation rates for the daily (ADT) and AM/PM peak hours are 2.48 trips per student per day and 0.81 and 0.17 trips per AM and PM peak hours, respectively.

In terms of traffic generation, the project is separated into two phases. The first phase is a 200 student phase and the second is a total of 600 student phase. Using the trip generation rates, the project is expected to generate the following amount of traffic on a daily and peak hour basis.

Table 3
Project Trip Generation

	Students	Daily Trips	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
	Trip Rates	2.48	0.49	0.32	0.81	0.07	0.10	0.17
Phase 1	200	496	98	64	162	15	19	34
Phase 3	600	1488	294	192	486	44	58	102

The trip distribution for the school traffic was based on data contained in the original Los Robles Del Mar EIR and updated based on the current traffic counts and specifically for school traffic. The trip distribution during the AM peak hour and PM peak hour is as follows:

Orientation	AM Peak Hour	PM Peak Hour
North – Oak Park Boulevard	12.5%	12.5%
East – Meadowlark Drive	5%	5%
North – Highway 101	20%	20%
South – Highway 101	10%	10%
North – James Way	10%	10%
South – James Way	15%	15%
South – Oak Park Boulevard/Grover Beach	22.5%	22.5%
South – El Camino Real	5%	5%
Total	100%	100%

Phase 1 Traffic Impacts

To estimate the potential impact of the project, the project related traffic with Phase 1 was added to the existing conditions and the HCM delay values were recalculated. The results of this analysis are summarized in Tables 4 and 5 below.

Table 4
Existing Intersection Level of Service
AM Peak Hour Plus Project Phase 1

Location	AM Peak Hour	Plus Project Phase 1
Oak Park Boulevard at		
El Camino Real	32.4 sec delay / LOS C	33.4 sec delay / LOS C
W. Branch/NB 101 Ramp	17.4 sec delay / LOS B	17.5 sec delay / LOS B
James Way	13.5 sec delay / LOS B	14.6 sec delay / LOS B
Meadowlark Drive	1.0 sec delay / LOS A	3.0 sec delay / LOS A

Table 5
Existing Intersection Level of Service
PM Peak Hour Plus Project Phase 1

Location	PM Peak Hour	Plus Project Phase 1
Oak Park Boulevard at		
El Camino Real	33.7 sec delay / LOS C	34.0 sec delay / LOS C
W. Branch/NB 101 Ramp	22.1 sec delay / LOS C	22.6 sec delay / LOS C
James Way	14.2 sec delay / LOS B	14.2 sec delay / LOS B
Meadowlark Drive	0.6 sec delay/ LOS A	1.1 sec delay/ LOS A

As shown in these tables, the addition of Phase 1 project traffic does not change any of the existing conditions levels of service. All four intersections would operate very well at LOS C or better during the AM and PM peak hours.

This analysis assumes that the project access to Oak Park Boulevard is improved with the project access road/driveway being constructed and frontage improvements along Oak Park Boulevard at Meadowlark Road to provide one travel lane in each direction with bike lane and center island median with left turn lane into the project access/Meadowlark Road. To accommodate the left turn traffic demand during the higher morning peak hour, the left turn lane should be constructed with 250 feet of storage or to accommodate storage of 10 vehicles. The project roadway/driveway should provide one left turn lane and one right turn lane exiting the school and one lane entering the school. The intersection would have a STOP sign installed on the project roadway/driveway to form a 2-way STOP controlled intersection with existing Meadowlark Drive.

Phase 3 Traffic Impacts

Similarly, the traffic generated with the second student phase of the project (Project Phase 3) was superimposed on the existing conditions peak hour traffic volumes and the intersection delay values were recalculated. The results of that analysis are summarized in Tables 6 and 7 for the AM and PM peak hours respectively.

Table 6
Future Intersection Level of Service
AM Peak Hour Plus Project Phase 3

Location	AM Peak Hour	Plus Project Phase 3
Oak Park Boulevard at		
El Camino Real	32.4 sec delay / LOS C	34.3 sec delay / LOS C
W. Branch/NB 101 Ramp	17.4 sec delay / LOS B	17.7 sec delay / LOS B
James Way	13.5 sec delay / LOS B	15.3 sec delay / LOS B
Meadowlark Drive	1.0 sec delay / LOS A	8.0 sec delay/ LOS A

Table 7
Future Intersection Level of Service
PM Peak Hour Plus Project Phase 3

Location	PM Peak Hour	Plus Project Phase 3
Oak Park Boulevard at		
El Camino Real	33.7 sec delay / LOS C	34.5 sec delay / LOS C
W. Branch/NB 101 Ramp	22.1 sec delay / LOS C	22.8 sec delay / LOS C
James Way	14.2 sec delay / LOS B	14.3 sec delay / LOS B
Meadowlark Drive	0.6 sec delay/ LOS A	1.9 sec delay/ LOS A

As shown in these tables, the addition of Phase 3 project traffic does not change any of the existing conditions levels of service. All of the study area intersections would operate at LOS C or better during the AM and PM peak hours. The project would not result in any project related traffic impacts under the future traffic conditions.

FUTURE CONDITIONS

For this study, the previous traffic study and EIR for the overall Los Robles Del Mar project forms the basis for the assessment of future and regional impacts. The scope of this study is to address more school specific traffic impacts. The cumulative impacts of the other approved and pending projects, including the overall Los Robles Del Mar were addressed in the EIR in 2003. In that study, school traffic totaling 1,380 ADT, 460 AM and 100 PM peak hour trips were included in the analysis. Currently, the project as proposed is expected to generate 1,488 ADT, 486 AM and 102 PM peak hour trips. The current project traffic estimate is slightly higher than the previous project by 108 ADT, 26 AM and 2 PM peak hour trips. This study has shown that the proposed school project can still be accommodated within the overall circulation system.

In the future traffic conditions analysis that follows, the previous cumulative traffic volumes projected by the Los Robles Del Mar EIR were used as the baseline conditions to determine the potential impact of the current school project. The change from the then existing traffic to the cumulative traffic was added to the now current peak hour traffic volumes for the study area intersections.

The baseline of future traffic conditions for the study area intersections were found by calculating the HCM Delay value using the revised future cumulative traffic volumes, including the revised School traffic volumes. The results of those calculations are summarized below in Table 8 of the AM and PM peak hours. As seen in this table, all of the study area intersections are forecast to operate at LOS C or better and are consistent with the levels of service projected in the 2003 Los Robles Del Mar EIR and other studies.

Table 8
Cumulative Intersection Level of Service
AM and PM Peak Hours

Location	AM Peak Hour	PM Peak Hour
Oak Park Boulevard at		
El Camino Real	34.3 sec delay / LOS C	34.1 sec delay / LOS C
W. Branch/NB 101 Ramp	19.0 sec delay / LOS B	29.6 sec delay / LOS C
James Way	16.1 sec delay / LOS B	14.3 sec delay / LOS B
Meadowlark Drive	15.7 sec delay / LOS B	11.6 sec delay / LOS B

SITE ACCESS AND RIGHT OF WAY CONTROL

Originally, the school proposed to take direct access to Oak Park Boulevard midway between James Way and Meadowlark Drive. Concurrent with Phase 1 development, a three lane roadway would be constructed at the project intersection with Oak Park Boulevard to accommodate the project traffic. Initially, a STOP sign would be placed on the project access approach to the intersection with Oak Park Boulevard. However, the City of Arroyo Grande and County of San Luis Obispo, requested that the main entrance be moved to align with Meadowlark Road consistent with the LRDM master plan. This analysis assumes that the revised alignment is the main project access. The original access would be utilized as an emergency / exit only access. The project would construct a fourth leg to the existing Meadowlark Road intersection. The project would be required to construct left turn lanes for Oak Park Boulevard to

turn onto the project site and onto Meadowlark Road. Curb, gutter and sidewalk improvements would also be constructed within 250 feet of the intersection along the project frontage.

Ultimately, when the student totals associated with Phase 3 project traffic are realized, the school driveway/ access road intersection with Meadowlark Road would need to be signalized to accommodate the peak hour traffic demands. Even though the intersection level of service proposed does not exceed the County thresholds of significance, the amount of traffic assumed to enter or leave during the primary school hours could result in excessive left turn delays.

SUMMARY AND CONCLUSIONS

The proposed Coastal Christian School would be constructed in multiple phases. In terms of traffic generation, the project has two phases. The initial project phase would replace the existing school traffic. The third project phase would increase enrollment to the maximum proposed. The traffic impact analysis has shown that the project (either initial Phase or build out Phase) does not create any significant traffic related impacts along the area road network.

The project would construct a main access, aligned with Meadowlark Road, on Oak Park Boulevard to form a four leg, two-way stop controlled intersection. Appropriate curb, gutter and sidewalk would be constructed within 250 feet along the project frontage. An emergency access/exit only driveway would also be constructed to intersect Oak Park Boulevard, mid-way between James Way and Meadowlark Road.

Ultimately, the Meadowlark Road intersection with Oak Park Boulevard would require signalization with the maximum enrollment proposed by the school.

MITIGATION MEASURES

The proposed project is planned to be developed over a number of years in a number of phases. Two phases (Phase 1 and Phase 3) are most likely the key development phases in terms of additional student loads at the campus and therefore traffic volumes being added to the road network.

Phase 1 Improvements

To provide frontage improvements, the project would be required to improve the northwestern curbline along Oak Park Boulevard to provide pavement, curb, gutter and sidewalks to provide one travel lane, bike lane and center median.

To address project traffic entering the site, the project during Phase 1 would construct a 250 foot long left turn lane in the center median and a similar left turn lane for southbound traffic to enter Meadowlark Road.

The project would be required to construct an access road/driveway to the main campus from Oak Park Boulevard. At the intersection with Oak Park Boulevard at Meadowlark Road, there would be two lanes for exiting site traffic and one entering lane. The second exiting lane would be approximately 150 feet in length. One travel lane entering the site from Oak Park Boulevard would provide adequate capacity for the project. Beyond the intersection with Oak Park Boulevard, one travel lane in each direction would provide adequate capacity for site ingress and egress. The emergency access / exit only driveway would be constructed to minimum Fire Department standards.

Phase 3 Improvements

In addition to the Phase 1 improvements, a traffic signal would be installed to accommodate school traffic when the Phase 3 enrollment is approached. During Phase 1, the underground conduits and curb returns should be installed at the intersection to address the future traffic signal installation.

Traffic Impact Analysis Appendices

For

Coastal Christian School

San Luis Obispo County

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Phase 1 Site Trip Generation

Total Students 200

AM PHT Trip Rate	In	Out	Total
In/Out	0.49	0.32	0.81

PM PHT Trip Rate	In	Out	Total
In/Out	0.07	0.10	0.17

Phase 1 - Trip Generation

AM PHT	In	Out	Total
	98	64	162

PM PHT	In	Out	Total
	15	19	34

ADT	Rate	Trips
	2.48	496

Source: ITE Code 536

**Phase 3 Site
Trip Generation**

Total Students **600**

AM PHT Trip Rate	In	Out	Total
In/Out	0.49	0.32	0.81
PM PHT Trip Rate	In	Out	Total
In/Out	0.07	0.10	0.17

Phase 5 - Trip Generation

AM PHT	In	Out	Total
294	192	486	

PM PHT	In	Out	Total
44	58	102	

ADT	Rate	Trips
2.48		1488

Source: ITE Code 536

City Traffic Counters
626.256.4171

File Name : OakPJames
 Site Code : 00000000
 Start Date : 6/3/2008
 Page No : 1

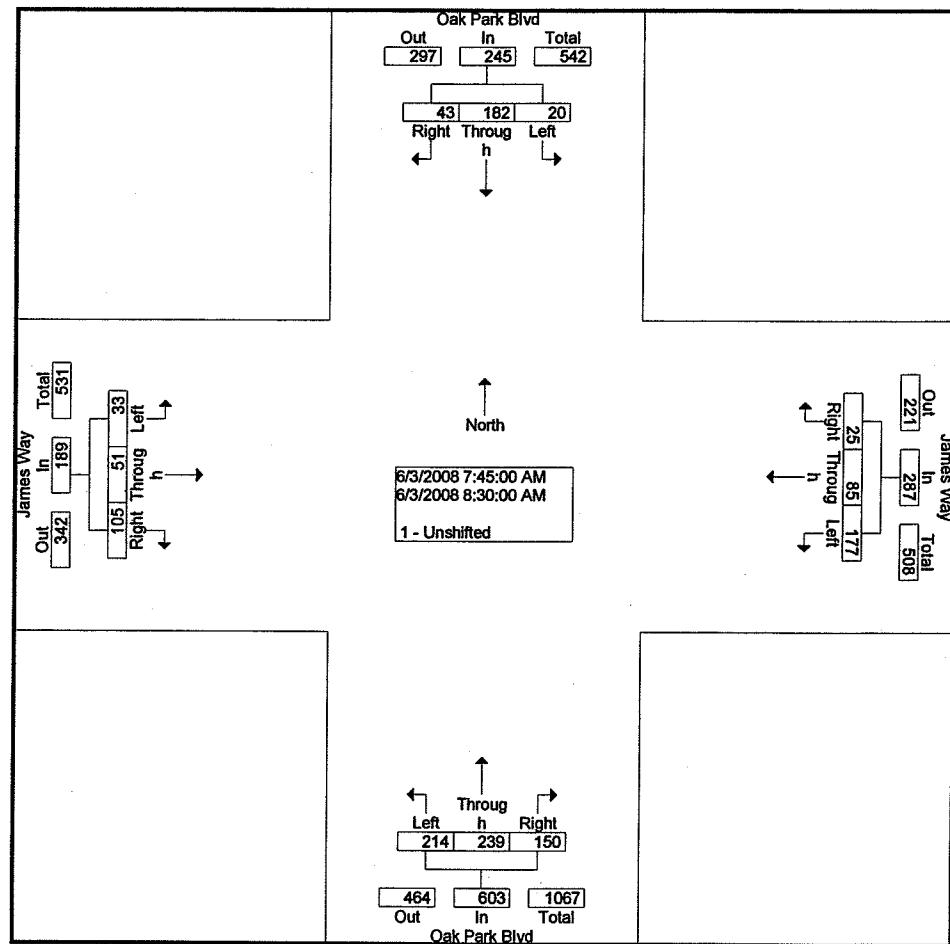
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	Oak Park Blvd Southbound			James Way Westbound			Oak Park Blvd Northbound			James Way Eastbound			
Start Time	Left	Throug h	Right	Left	Throug h	Right	Left	Throug h	Right	Left	Throug h	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	2	39	10	21	12	5	17	43	7	7	6	21	190
07:15 AM	4	42	12	29	11	4	20	49	15	9	6	20	221
07:30 AM	3	61	8	41	10	7	35	59	16	7	9	31	287
07:45 AM	5	38	6	35	25	8	47	56	43	7	9	26	305
Total	14	180	36	126	58	24	119	207	81	30	30	98	1003
08:00 AM	5	37	9	34	19	8	50	66	31	10	11	17	297
08:15 AM	4	60	16	56	21	4	63	68	31	10	13	30	376
08:30 AM	6	47	12	52	20	5	54	49	45	6	18	32	346
08:45 AM	4	51	11	22	15	1	44	36	43	6	12	33	278
Total	19	195	48	164	75	18	211	219	150	32	54	112	1297
04:00 PM	5	66	17	31	17	7	68	56	49	29	35	45	425
04:15 PM	9	56	19	31	21	2	56	54	27	20	31	67	393
04:30 PM	10	67	14	31	12	6	41	45	29	15	32	52	354
04:45 PM	7	67	15	25	17	2	54	61	43	20	37	60	408
Total	31	256	65	118	67	17	219	216	148	84	135	224	1580
05:00 PM	7	92	9	32	18	0	41	70	50	18	28	54	419
05:15 PM	5	81	10	40	22	6	48	53	43	10	34	40	392
05:30 PM	5	84	11	27	18	2	23	54	39	27	36	38	364
05:45 PM	8	55	10	25	9	5	40	40	27	12	19	25	275
Total	25	312	40	124	67	13	152	217	159	67	117	157	1450
Grand Total	89	943	189	532	267	72	701	859	538	213	336	591	5330
Apprch %	7.3	77.2	15.5	61.1	30.7	8.3	33.4	40.9	25.6	18.7	29.5	51.8	
Total %	1.7	17.7	3.5	10.0	5.0	1.4	13.2	16.1	10.1	4.0	6.3	11.1	

City Traffic Counters
626.256.4171

File Name : OakPJames
Site Code : 00000000
Start Date : 6/3/2008
Page No : 2

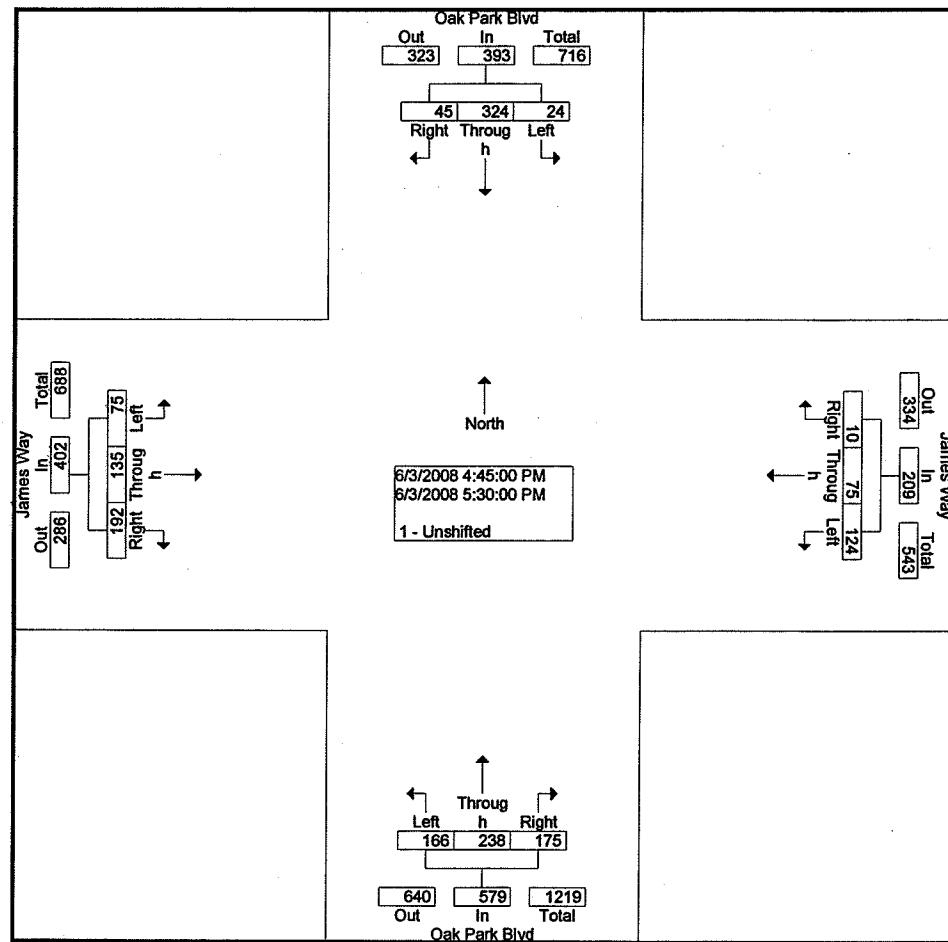
	Oak Park Blvd Southbound					James Way Westbound					Oak Park Blvd Northbound					James Way Eastbound				
Start Time	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Int. Total			
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																				
Intersection	07:45 AM																			
Volume	20	182	43	245	177	85	25	287	214	239	150	603	33	51	105	189	1324			
Percent	8.2	74.3	17.6		61.7	29.6	8.7		35.5	39.6	24.9		17.5	27.0	55.6					
08:15																				
Volume	4	60	16	80	56	21	4	81	63	68	31	162	10	13	30	53	376			
Peak Factor																	0.880			
High Int.	08:15 AM				08:15 AM				08:15 AM				08:30 AM							
Volume	4	60	16	80	56	21	4	81	63	68	31	162	6	18	32	56				
Peak Factor				0.766				0.886				0.931					0.844			



City Traffic Counters
626.256.4171

File Name : OakPJames
 Site Code : 00000000
 Start Date : 6/3/2008
 Page No : 3

Start Time	Oak Park Blvd Southbound				James Way Westbound				Oak Park Blvd Northbound				James Way Eastbound				Int. Total
	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:45 PM				05:15 PM				05:00 PM				04:45 PM				
Volume	24	324	45	393	124	75	10	209	166	238	175	579	75	135	192	402	1583
Percent	6.1	82.4	11.5		59.3	35.9	4.8		28.7	41.1	30.2		18.7	33.6	47.8		
05:00																	
Volume	7	92	9	108	32	18	0	50	41	70	50	161	18	28	54	100	419
Peak Factor																	0.945
High Int.	05:00 PM				05:15 PM				05:00 PM				04:45 PM				
Volume	7	92	9	108	40	22	6	68	41	70	50	161	20	37	60	117	
Peak Factor				0.910				0.768				0.899					0.859



City Traffic Counters
626.256.4171

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 Page No : 1

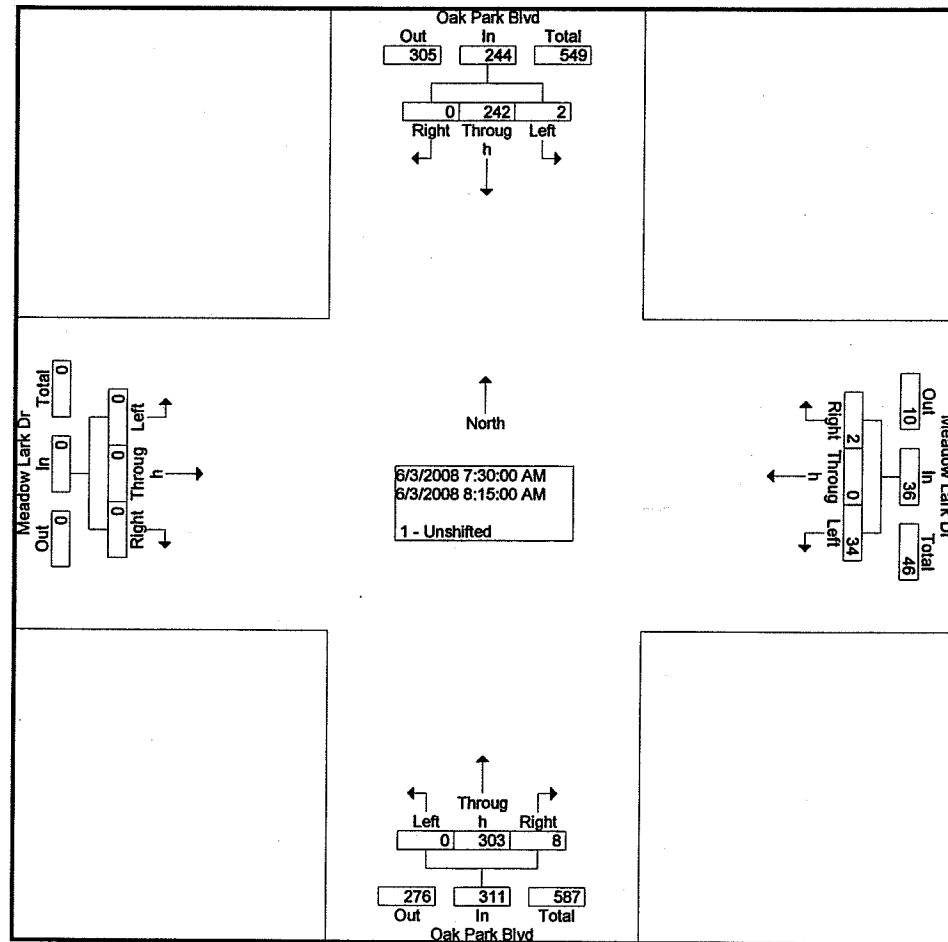
Groups Printed- 1 - Unshifted

Start Time	Oak Park Blvd Southbound			Meadow Lark Dr Westbound			Oak Park Blvd Northbound			Meadow Lark Dr Eastbound			Int. Total
	Left	Throug h	Right										
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
07:00 AM	1	38	0	6	0	2	0	43	0	0	0	0	90
07:15 AM	0	58	0	11	0	2	0	59	2	0	0	0	132
07:30 AM	1	62	0	12	0	0	0	71	1	0	0	0	147
07:45 AM	0	66	0	6	0	2	0	70	3	0	0	0	147
Total	2	224	0	35	0	6	0	243	6	0	0	0	516
08:00 AM	0	58	0	2	0	0	0	77	4	0	0	0	141
08:15 AM	1	56	0	14	0	0	0	85	0	0	0	0	156
08:30 AM	0	71	0	7	0	1	0	58	1	0	0	0	138
08:45 AM	0	69	0	8	0	3	0	44	1	0	0	0	125
Total	1	254	0	31	0	4	0	264	6	0	0	0	560
04:00 PM	1	78	0	4	0	1	0	77	6	0	0	0	167
04:15 PM	0	82	0	6	0	0	0	74	7	0	0	0	169
04:30 PM	1	86	0	2	0	2	0	60	3	0	0	0	154
04:45 PM	0	88	0	8	0	1	0	73	3	0	0	0	173
Total	2	334	0	20	0	4	0	284	19	0	0	0	663
05:00 PM	2	82	0	3	1	0	0	80	7	0	0	0	175
05:15 PM	2	91	0	6	0	0	0	70	9	0	0	0	178
05:30 PM	5	90	0	5	0	0	0	79	5	0	0	0	184
05:45 PM	6	77	0	3	0	4	0	55	2	0	0	0	147
Total	15	340	0	17	1	4	0	284	23	0	0	0	684
Grand Total	20	1152	0	103	1	18	0	1075	54	0	0	0	2423
Apprch %	1.7	98.3	0.0	84.4	0.8	14.8	0.0	95.2	4.8	0.0	0.0	0.0	
Total %	0.8	47.5	0.0	4.3	0.0	0.7	0.0	44.4	2.2	0.0	0.0	0.0	

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File Name : OakPMead
Site Code : 00000000
Start Date : 6/3/2008
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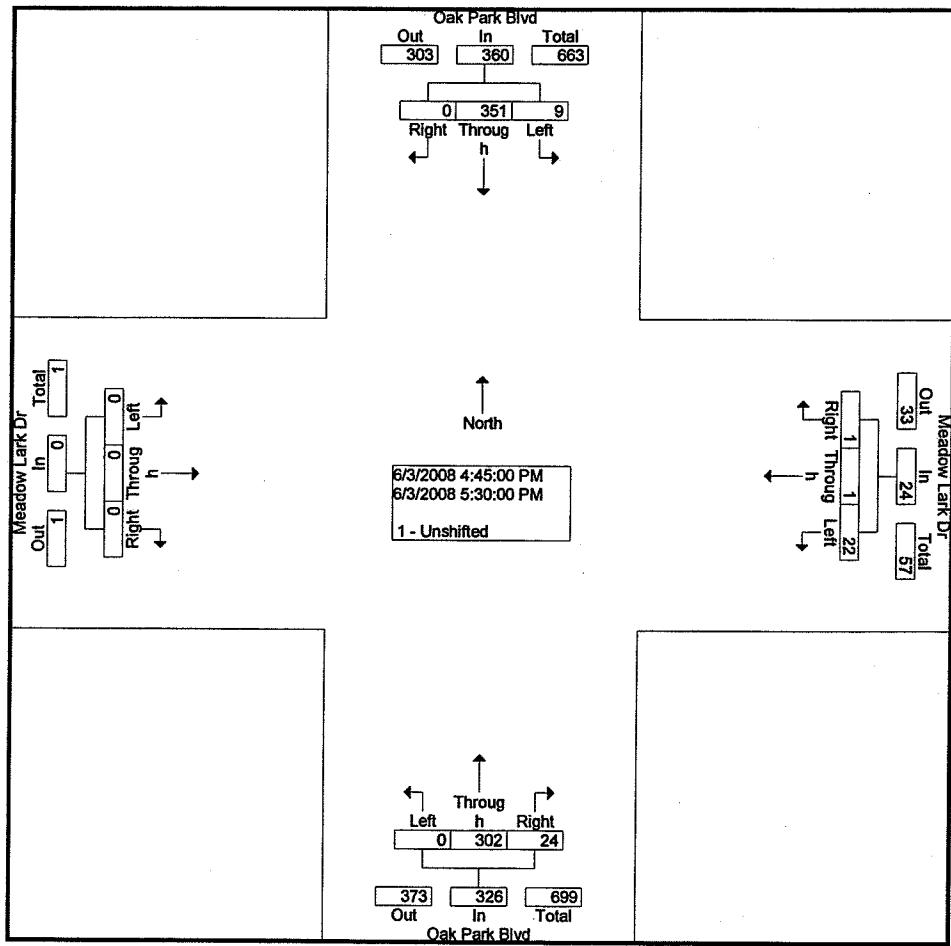
	Oak Park Blvd Southbound				Meadow Lark Dr Westbound				Oak Park Blvd Northbound				Meadow Lark Dr Eastbound				
Start Time	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:30 AM				34 0 2 36				0 303 8 311				0 0 0 0				591
Volume	2	242	0	244	94.4	0.0	5.6	36	0.0	97.4	2.6	311	0.0	0.0	0.0	0	
Percent	0.8	99.2	0.0														
08:15	1	56	0	57	14	0	0	14	0	85	0	85	0	0	0	0	
Volume																156	
Peak Factor																0.947	
High Int.	07:45 AM				08:15 AM				08:15 AM				6:45:00 AM				
Volume	0	66	0	66	14	0	0	14	0	85	0	85	0	0	0	0	
Peak Factor																0.915	



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File Name : OakPMead
 Site Code : 00000000
 Start Date : 6/3/2008
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	Oak Park Blvd Southbound				Meadow Lark Dr Westbound				Oak Park Blvd Northbound				Meadow Lark Dr Eastbound				
Start Time	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Left	Thro ug h	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:45 PM				04:45 PM				05:00 PM				05:30 PM				
Volume	9	351	0	360	22	1	1	24	0	302	24	326	0	0	0	0	710
Percent	2.5	97.5	0.0		91.7	4.2	4.2		0.0	92.6	7.4		0.0	0.0	0.0		
05:30	5	90	0	95	5	0	0	5	0	79	5	84	0	0	0	0	184
Volume																	0.965
Peak Factor																	
High Int.	05:30 PM				04:45 PM				05:00 PM				05:30 PM				
Volume	5	90	0	95	8	0	1	9	0	80	7	87	0.667	0.937			
Peak Factor																	



City Traffic Counters
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Page 1

Site Code: 000000000000

Station ID:

Oak Park Blvd

Bt James & Meadowlark

Latitude: 0' 0.000 Undefined

Start Time	03-Jun-08 Tue	North	South	Total
12:00 AM		3	5	8
12:15		3	2	5
12:30		4	4	8
12:45		2	0	2
01:00		0	1	1
01:15		3	3	6
01:30		0	2	2
01:45		2	1	3
02:00		1	0	1
02:15		2	1	3
02:30		2	0	2
02:45		3	1	4
03:00		1	1	2
03:15		1	2	3
03:30		1	0	1
03:45		2	0	2
04:00		2	1	3
04:15		1	2	3
04:30		1	4	5
04:45		1	3	4
05:00		2	12	14
05:15		4	6	10
05:30		8	14	22
05:45		17	20	37
06:00		25	8	33
06:15		31	22	53
06:30		52	36	88
06:45		64	32	96
07:00		50	53	103
07:15		62	61	123
07:30		79	82	161
07:45		72	69	131
08:00		84	56	140
08:15		84	46	170
08:30		60	64	124
08:45		46	32	128
09:00		52	53	115
09:15		38	54	92
09:30		52	42	94
09:45		30	60	90
10:00		32	57	89
10:15		44	68	112
10:30		46	38	84
10:45		34	42	76
11:00		47	44	91
11:15		54	56	110
11:30		52	64	116
11:45		47	56	103
Total		1303	1370	2673
Percent		48.7%	51.3%	
Peak		07:30	08:15	07:30
Vol.		319	295	602
P.H.F.		0.949	0.858	0.885

City Traffic Counters
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Site Code: 000000000000

Station ID:

Oak Park Blvd

Bt James & Meadowlark

Latitude: 0' 0.000 Undefined

Start Time	03-Jun-08 Tue	North	South	Total
12:00 PM		66	53	119
12:15		53	54	107
12:30		51	66	117
12:45		56	40	96
01:00		63	66	129
01:15		60	65	125
01:30		52	50	102
01:45		46	70	116
02:00		48	56	104
02:15		60	58	118
02:30		57	84	141
02:45		76	60	156
03:00		67	62	129
03:15		86	58	144
03:30		58	88	156
03:45		86	89	175
04:00		79	82	161
04:15		69	90	159
04:30		57	84	141
04:45		78	92	170
05:00		82	107	189
05:15		73	180	173
05:30		82	94	176
05:45		62	74	136
06:00		68	70	138
06:15		46	66	112
06:30		62	52	114
06:45		38	53	91
07:00		52	42	94
07:15		44	42	86
07:30		52	28	80
07:45		41	54	95
08:00		42	39	81
08:15		32	24	56
08:30		46	28	74
08:45		57	21	78
09:00		28	16	44
09:15		17	13	30
09:30		25	16	41
09:45		11	11	22
10:00		16	20	36
10:15		14	9	23
10:30		9	5	14
10:45		9	4	13
11:00		9	10	19
11:15		3	2	5
11:30		3	4	7
11:45		5	4	9
Total		2306	2395	4701
Percent		49.1%	50.9%	
Peak		15:15	16:45	16:45
Vol.		319	393	708
P.H.F.		0.927	0.918	0.937

City Traffic Counters
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Page 1

Site Code:

Station ID:

Oak Park Blvd

N/O Meadowlark

Latitude: 0' 0.000 Undefined

Start Time	03-Jun-08 Tue	North	South	Total
12:00 AM		5	4	9
12:15		3	3	6
12:30		1	3	4
12:45		2	1	3
01:00		2	1	3
01:15		1	3	4
01:30		2	0	2
01:45		2	2	4
02:00		1	1	2
02:15		1	0	1
02:30		2	1	3
02:45		2	0	2
03:00		3	1	4
03:15		1	1	2
03:30		1	2	3
03:45		2	0	2
04:00		1	0	1
04:15		2	1	3
04:30		1	3	4
04:45		1	3	4
05:00		1	4	5
05:15		2	8	10
05:30		4	7	11
05:45		10	16	26
06:00		16	13	29
06:15		31	11	42
06:30		35	18	53
06:45		55	35	90
07:00		52	30	82
07:15		56	53	109
07:30		62	59	121
07:45		82	68	150
08:00		63	55	118
08:15		70	58	128
08:30		64	72	136
08:45		54	60	114
09:00		40	72	112
09:15		42	48	90
09:30		44	49	93
09:45		42	33	75
10:00		28	56	84
10:15		34	64	98
10:30		46	48	94
10:45		42	35	77
11:00		28	40	68
11:15		43	46	89
11:30		42	44	86
11:45		52	61	113
Total		1176	1193	2369
Percent		49.6%	50.4%	
Peak		07:45	08:15	07:45
Vol.		279	262	532
P.H.F.		0.851	0.910	0.887

City Traffic Counters
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Page 2

Site Code:
Station ID:

Oak Park Blvd

N/O Meadowlark

Latitude: 0' 0.000 Undefined

Start Time	03-Jun-08 Tue	North	South	Total
12:00 PM		42	50	92
12:15		52	50	102
12:30		50	43	93
12:45		49	56	105
01:00		51	53	104
01:15		52	62	114
01:30		58	42	100
01:45		42	45	87
02:00		39	60	99
02:15		48	53	101
02:30		50	65	115
02:45		52	68	120
03:00		52	71	123
03:15		57	52	109
03:30		87	63	150
03:45		68	80	148
04:00		66	73	139
04:15		67	85	152
04:30		58	78	136
04:45		54	89	143
05:00		74	80	154
05:15		68	94	162
05:30		61	97	158
05:45		68	81	149
06:00		58	70	128
06:15		56	59	115
06:30		40	66	106
06:45		58	50	108
07:00		42	46	88
07:15		38	40	78
07:30		33	32	65
07:45		47	24	71
08:00		34	40	74
08:15		31	28	59
08:30		24	22	46
08:45		42	20	62
09:00		57	23	80
09:15		16	17	33
09:30		20	11	31
09:45		19	10	29
10:00		7	14	21
10:15		15	15	30
10:30		11	6	17
10:45		12	8	20
11:00		6	3	9
11:15		3	6	9
11:30		2	0	2
11:45		4	6	10
Total		2040	2206	4246
Percent		48.0%	52.0%	
Peak		15:30	16:45	17:00
Vol.		288	360	623
P.H.F.		0.828	0.928	0.961

HCM Unsignedized Intersection Capacity Analysis
3: Oak Park Boulevard & LRDM

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control			Stop			Stop			Free			Free
Grade			0%			0%			0%			0%
Volume (veh/h)	0	0	0	41	0	0	0	316	18	2	292	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	45	0	0	0	343	20	2	317	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type			None			None						
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	665	685	317	675	675	353	317					363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	665	685	317	675	675	353	317					363
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	100	100	100	88	100	100	100					100
cM capacity (veh/h)	373	370	723	367	375	690	1243					1196

Direction	Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total		45	0	0	363	2	317
Volume Left		45	0	0	0	2	0
Volume Right		0	0	0	20	0	0
cSH		367	1700	1700	1700	1196	1700
Volume to Capacity		0.12	0.00	0.00	0.21	0.00	0.19
Queue Length 95th (ft)		10	0	0	0	0	0
Control Delay (s)		16.2	0.0	0.0	0.0	8.0	0.0
Lane LOS		C	A			A	
Approach Delay (s)		16.2		0.0		0.1	
Approach LOS		C					

Intersection Summary

Average Delay	1.0
Intersection Capacity Utilization	27.7%
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

8: Oak Park Boulevard & James Way

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1758		1770	3321		1770	3453	
Flt Permitted	0.67	1.00	1.00	0.73	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1252	1863	1583	1360	1758		1770	3321		1770	3453	
Volume (vph)	70	38	107	183	76	46	45	209	146	13	241	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	41	116	199	83	50	49	227	159	14	262	51
RTOR Reduction (vph)	0	0	92	0	40	0	0	74	0	0	24	0
Lane Group Flow (vph)	76	41	24	199	93	0	49	312	0	14	289	0
Turn Type	Perm		Perm	Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	10.4	10.4	10.4	10.4	10.4		2.4	26.8		0.8	25.2	
Effective Green, g (s)	10.4	10.4	10.4	10.4	10.4		2.4	26.8		0.8	25.2	
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.05	0.54		0.02	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	260	388	329	283	366		85	1780		28	1740	
v/s Ratio Prot		0.02			0.05		c0.03	c0.09		0.01	0.08	
v/s Ratio Perm	0.06		0.02	c0.15								
v/c Ratio	0.29	0.11	0.07	0.70	0.26		0.58	0.18		0.50	0.17	
Uniform Delay, d1	16.7	16.0	15.9	18.4	16.6		23.3	5.9		24.4	6.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.1	0.1	7.7	0.4		9.1	0.2		13.4	0.2	
Delay (s)	17.3	16.2	16.0	26.1	16.9		32.4	6.2		37.8	6.9	
Level of Service	B	B	B	C	B		C	A		D	A	
Approach Delay (s)		16.5			22.4			9.1			8.2	
Approach LOS		B			C		A				A	

Intersection Summary

HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

c = Critical Lane Group

HCM Signalized Intersection Capacity Analysis

12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor				1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt				1.00	0.87	0.85	1.00	0.95	1.00	1.00	0.95	1.00
Fit Protected				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)				1770	1547	1504	1770	3364		1770	3271	
Fit Permitted				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)				1770	1547	1504	1770	3364		1770	3271	
Volume (vph)	0	0	0	115	18	198	212	322	158	78	241	246
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	125	20	215	230	350	172	85	262	267
RTOR Reduction (vph)	0	0	0	0	74	78	0	106	0	0	189	0
Lane Group Flow (vph)	0	0	0	125	51	32	230	416	0	85	340	0
Turn Type				Perm		Perm	Prot			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases					8	8						
Actuated Green, G (s)				16.0	16.0	16.0	11.0	21.0		6.0	16.0	
Effective Green, g (s)				16.0	16.0	16.0	11.0	21.0		6.0	16.0	
Actuated g/C Ratio				0.29	0.29	0.29	0.20	0.38		0.11	0.29	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)				515	450	438	354	1284		193	952	
v/s Ratio Prot					0.03		c0.13	c0.12		0.05	0.10	
v/s Ratio Perm				c0.07		0.02						
v/c Ratio				0.24	0.11	0.07	0.65	0.32		0.44	0.36	
Uniform Delay, d1				14.9	14.3	14.1	20.2	12.0		22.9	15.4	
Progression Factor				1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2				1.1	0.5	0.3	8.9	0.7		7.1	1.0	
Delay (s)				16.0	14.8	14.5	29.2	12.7		30.1	16.5	
Level of Service				B	B	B	C	B		C	B	
Approach Delay (s)				0.0		15.1			17.7		18.4	
Approach LOS				A		B			B		B	

Intersection Summary

HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Oak Park Boulevard & El Camino Real

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	4	1	1	1	1	1	1	1	1	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.99		1.00	0.96	
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1708	1583	1770	1717		1770	3509		1770	3413	
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1708	1583	1770	1717		1770	3509		1770	3413	
Volume (vph)	273	46	167	85	31	34	74	738	44	94	365	114
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	50	182	92	34	37	80	802	48	102	397	124
RTOR Reduction (vph)	0	0	143	0	29	0	0	6	0	0	40	0
Lane Group Flow (vph)	169	178	39	92	42	0	80	844	0	102	481	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0		9.0	21.0		6.0	18.0	
Effective Green, g (s)	16.0	16.0	16.0	16.0	16.0		9.0	21.0		6.0	18.0	
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.12	0.28		0.08	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	359	364	338	378	366		212	983		142	819	
v/s Ratio Prot	0.10	c0.10		c0.05	0.02		0.05	c0.24		c0.06	0.14	
v/s Ratio Perm			0.02									
v/c Ratio	0.47	0.49	0.11	0.24	0.11		0.38	0.86		0.72	0.59	
Uniform Delay, d1	25.8	25.9	23.8	24.5	23.8		30.4	25.6		33.7	25.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	4.6	0.7	1.5	0.6		5.1	9.7		26.7	3.1	
Delay (s)	30.2	30.5	24.5	26.0	24.4		35.5	35.3		60.4	28.3	
Level of Service	C	C	C	C	C		D	D		E	C	
Approach Delay (s)		28.3			25.3			35.3			33.6	
Approach LOS		C			C		D	D			C	

Intersection Summary

HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
3: Oak Park Boulevard & LRDM

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	0	0	0	22	0	1	0	264	36	6	333	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	24	0	1	0	287	39	7	362	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	663	701	362	682	682	307	362			326		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	663	701	362	682	682	307	362			326		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	100			99		
cM capacity (veh/h)	373	361	683	363	370	733	1197			1234		

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	24	1	0	326	7	362
Volume Left	24	0	0	0	7	0
Volume Right	0	1	0	39	0	0
cSH	363	733	1700	1700	1234	1700
Volume to Capacity	0.07	0.00	0.00	0.19	0.01	0.21
Queue Length 95th (ft)	5	0	0	0	0	0
Control Delay (s)	15.6	9.9	0.0	0.0	7.9	0.0
Lane LOS	C	A			A	
Approach Delay (s)	15.4		0.0		0.1	
Approach LOS	C					

Intersection Summary

Average Delay	0.6
Intersection Capacity Utilization	27.5%
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis
8: Oak Park Boulevard & James Way

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Fr _t	1.00	1.00	0.85	1.00	0.98		1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1834		1770	3275		1770	3446	
Flt Permitted	0.71	1.00	1.00	0.65	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1326	1863	1583	1216	1834		1770	3275		1770	3446	
Volume (vph)	127	152	197	139	57	6	151	214	212	38	338	72
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	165	214	151	62	7	164	233	230	41	367	78
RTOR Reduction (vph)	0	0	167	0	5	0	0	117	0	0	33	0
Lane Group Flow (vph)	138	165	47	151	64	0	164	346	0	41	412	0
Turn Type	Perm		Perm	Perm			Prot		Prot			
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	11.0	11.0	11.0	11.0	11.0		8.5	24.5		2.5	18.5	
Effective Green, g (s)	11.0	11.0	11.0	11.0	11.0		8.5	24.5		2.5	18.5	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22		0.17	0.49		0.05	0.37	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	292	410	348	268	403		301	1605		89	1275	
v/s Ratio Prot		0.09			0.03		c0.09	0.11		0.02	c0.12	
v/s Ratio Perm	0.10		0.03	c0.12								
v/c Ratio	0.47	0.40	0.14	0.56	0.16		0.54	0.22		0.46	0.32	
Uniform Delay, d1	17.0	16.7	15.7	17.4	15.8		19.0	7.3		23.1	11.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.6	0.2	2.7	0.2		2.0	0.3		3.7	0.7	
Delay (s)	18.2	17.3	15.9	20.1	15.9		21.0	7.6		26.8	11.9	
Level of Service	B	B	B	C	B		C	A		C	B	
Approach Delay (s)		16.9			18.8			11.1			13.2	
Approach LOS	B			B			B				B	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c - Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor				1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Frt				1.00	0.88	0.85	1.00	0.93		1.00	0.96	
Flt Protected				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)				1770	1563	1504	1770	3289		1770	3413	
Flt Permitted				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)				1770	1563	1504	1770	3289		1770	3413	
Volume (vph)	0	0	0	367	38	283	218	499	445	116	623	195
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	399	41	308	237	542	484	126	677	212
RTOR Reduction (vph)	0	0	0	0	101	117	0	294	0	0	54	0
Lane Group Flow (vph)	0	0	0	399	83	48	237	732	0	126	835	0
Turn Type				Perm		Perm	Prot			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8						
Actuated Green, G (s)				16.0	16.0	16.0	10.0	21.0		6.0	17.0	
Effective Green, g (s)				16.0	16.0	16.0	10.0	21.0		6.0	17.0	
Actuated g/C Ratio				0.29	0.29	0.29	0.18	0.38		0.11	0.31	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)				515	455	438	322	1256		193	1055	
v/s Ratio Prot					0.05		c0.13	c0.22		0.07	c0.24	
v/s Ratio Perm				c0.23		0.03						
v/c Ratio				0.77	0.18	0.11	0.74	0.58		0.65	0.79	
Uniform Delay, d1				17.9	14.6	14.3	21.3	13.5		23.5	17.4	
Progression Factor				1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2				10.9	0.9	0.5	13.9	2.0		15.9	6.1	
Delay (s)				28.7	15.5	14.8	35.2	15.5		39.4	23.5	
Level of Service				C	B	B	D	B		D	C	
Approach Delay (s)	0.0				22.4			19.2			25.4	
Approach LOS	A				C			B			C	

Intersection Summary

HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
15: Oak Park Boulevard & El Camino Real

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑↑	↑	↑	↑↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.99		1.00	0.97	
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1750	1583	1770	1641		1770	3518		1770	3425	
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1750	1583	1770	1641		1770	3518		1770	3425	
Volume (vph)	406	270	416	48	18	71	68	824	35	102	806	220
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	441	293	452	52	20	77	74	896	38	111	876	239
RTOR Reduction (vph)	0	0	287	0	71	0	0	3	0	0	23	0
Lane Group Flow (vph)	357	377	165	52	26	0	74	931	0	111	1092	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	21.4	21.4	21.4	6.9	6.9		4.0	37.1		8.6	41.7	
Effective Green, g (s)	21.4	21.4	21.4	6.9	6.9		4.0	37.1		8.6	41.7	
Actuated g/C Ratio	0.24	0.24	0.24	0.08	0.08		0.04	0.41		0.10	0.46	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	400	416	376	136	126		79	1450		169	1587	
v/s Ratio Prot	0.21	c0.22		c0.03	0.02		0.04	0.26		c0.06	c0.32	
v/s Ratio Perm			0.10									
v/c Ratio	0.89	0.91	0.44	0.38	0.21		0.94	0.64		0.66	0.69	
Uniform Delay, d1	33.2	33.3	29.2	39.5	39.0		42.9	21.1		39.3	19.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.4	22.8	0.8	1.8	0.8		79.2	2.2		8.9	2.5	
Delay (s)	54.5	56.1	30.0	41.3	39.8		122.1	23.3		48.1	21.5	
Level of Service	D	E	C	D	D		F	C		D	C	
Approach Delay (s)	45.7			40.3			30.6			23.9		
Approach LOS	D			D			C			C		

Intersection Summary

HCM Average Control Delay	33.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
3: Oak Park Boulevard & LRDM

3/27/2009

MOVEMENT	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30	R31	R32	R33	R34	R35	R36	R37	R38	R39	R40	R41	R42	R43	R44	R45	R46	R47	R48	R49	R50	R51	R52	R53	R54	R55	R56	R57	R58	R59	R60	R61	R62	R63	R64	R65	R66	R67	R68	R69	R70	R71	R72	R73	R74	R75	R76	R77	R78	R79	R80	R81	R82	R83	R84	R85	R86	R87	R88	R89	R90	R91	R92	R93	R94	R95	R96	R97	R98	R99	R100	R101	R102	R103	R104	R105	R106	R107	R108	R109	R110	R111	R112	R113	R114	R115	R116	R117	R118	R119	R120	R121	R122	R123	R124	R125	R126	R127	R128	R129	R130	R131	R132	R133	R134	R135	R136	R137	R138	R139	R140	R141	R142	R143	R144	R145	R146	R147	R148	R149	R150	R151	R152	R153	R154	R155	R156	R157	R158	R159	R160	R161	R162	R163	R164	R165	R166	R167	R168	R169	R170	R171	R172	R173	R174	R175	R176	R177	R178	R179	R180	R181	R182	R183	R184	R185	R186	R187	R188	R189	R190	R191	R192	R193	R194	R195	R196	R197	R198	R199	R200	R201	R202	R203	R204	R205	R206	R207	R208	R209	R210	R211	R212	R213	R214	R215	R216	R217	R218	R219	R220	R221	R222	R223	R224	R225	R226	R227	R228	R229	R230	R231	R232	R233	R234	R235	R236	R237	R238	R239	R240	R241	R242	R243	R244	R245	R246	R247	R248	R249	R250	R251	R252	R253	R254	R255	R256	R257	R258	R259	R260	R261	R262	R263	R264	R265	R266	R267	R268	R269	R270	R271	R272	R273	R274	R275	R276	R277	R278	R279	R280	R281	R282	R283	R284	R285	R286	R287	R288	R289	R290	R291	R292	R293	R294	R295	R296	R297	R298	R299	R300	R310	R320	R330	R340	R350	R360	R370	R380	R390	R400	R410	R420	R430	R440	R450	R460	R470	R480	R490	R500	R510	R520	R530	R540	R550	R560	R570	R580	R590	R600	R610	R620	R630	R640	R650	R660	R670	R680	R690	R700	R710	R720	R730	R740	R750	R760	R770	R780	R790	R800	R810	R820	R830	R840	R850	R860	R870	R880	R890	R900	R910	R920	R930	R940	R950	R960	R970	R980	R990	R1000	R1010	R1020	R1030	R1040	R1050	R1060	R1070	R1080	R1090	R1100	R1110	R1120	R1130	R1140	R1150	R1160	R1170	R1180	R1190	R1200	R1210	R1220	R1230	R1240	R1250	R1260	R1270	R1280	R1290	R1300	R1310	R1320	R1330	R1340	R1350	R1360	R1370	R1380	R1390	R1400	R1410	R1420	R1430	R1440	R1450	R1460	R1470	R1480	R1490	R1500	R1510	R1520	R1530	R1540	R1550	R1560	R1570	R1580	R1590	R1600	R1610	R1620	R1630	R1640	R1650	R1660	R1670	R1680	R1690	R1700	R1710	R1720	R1730	R1740	R1750	R1760	R1770	R1780	R1790	R1800	R1810	R1820	R1830	R1840	R1850	R1860	R1870	R1880	R1890	R1900	R1910	R1920	R1930	R1940	R1950	R1960	R1970	R1980	R1990	R2000	R2010	R2020	R2030	R2040	R2050	R2060	R2070	R2080	R2090	R2100	R2110	R2120	R2130	R2140	R2150	R2160	R2170	R2180	R2190	R2200	R2210	R2220	R2230	R2240	R2250	R2260	R2270	R2280	R2290	R2300	R2310	R2320	R2330	R2340	R2350	R2360	R2370	R2380	R2390	R2400	R2410	R2420	R2430	R2440	R2450	R2460	R2470	R2480	R2490	R2500	R2510	R2520	R2530	R2540	R2550	R2560	R2570	R2580	R2590	R2600	R2610	R2620	R2630	R2640	R2650	R2660	R2670	R2680	R2690	R2700	R2710	R2720	R2730	R2740	R2750	R2760	R2770	R2780	R2790	R2800	R2810	R2820	R2830	R2840	R2850	R2860	R2870	R2880	R2890	R2900	R2910	R2920	R2930	R2940	R2950	R2960	R2970	R2980	R2990	R3000	R3100	R3200	R3300	R3400	R3500	R3600	R3700	R3800	R3900	R4000	R4100	R4200	R4300	R4400	R4500	R4600	R4700	R4800	R4900	R5000	R5100	R5200	R5300	R5400	R5500	R5600	R5700	R5800	R5900	R6000	R6100	R6200	R6300	R6400	R6500	R6600	R6700	R6800	R6900	R7000	R7100	R7200	R7300	R7400	R7500	R7600	R7700	R7800	R7900	R8000	R8100	R8200	R8300	R8400	R8500	R8600	R8700	R8800	R8900	R9000	R9100	R9200	R9300	R9400	R9500	R9600	R9700	R9800	R9900	R10000	R10100	R10200	R10300	R10400	R10500	R10600	R10700	R10800	R10900	R11000	R11100	R11200	R11300	R11400	R11500	R11600	R11700	R11800	R11900	R12000	R12100	R12200	R12300	R12400	R12500	R12600	R12700	R12800	R12900	R13000	R13100	R13200	R13300	R13400	R13500	R13600	R13700	R13800	R13900	R14000	R14100	R14200	R14300	R14400	R14500	R14600	R14700	R14800	R14900	R15000	R15100	R15200	R15300	R15400	R15500	R15600	R15700	R15800	R15900	R16000	R16100	R16200	R16300	R16400	R16500	R16600	R16700	R16800	R16900	R17000	R17100	R17200	R17300	R17400	R17500	R17600	R17700	R17800	R17900	R18000	R18100	R18200	R18300	R18400	R18500	R18600	R18700	R18800	R18900	R19000	R19100	R19200	R19300	R19400	R19500	R19600	R19700	R19800	R19900	R20000	R20100	R20200	R20300	R20400	R20500	R20600	R20700	R20800	R20900	R21000	R21100	R21200	R21300	R21400	R21500	R21600	R21700	R21800	R21900	R22000	R22100	R22200	R22300	R22400	R22500	R22600	R22700	R22800	R22900	R23000	R23100	R23200	R23300	R23400	R23500	R23600	R23700	R23800	R23900	R24000	R24100	R24200	R24300	R24400	R24500	R24600	R24700	R24800	R24900	R25000	R25100	R25200	R25300	R25400	R25500	R25600	R25700	R25800	R25900	R26000	R26100	R26200	R26300	R26400	R26500	R26600	R26700	R26800	R26900	R27000	R27100	R27200	R27300	R27400	R27500	R27600	R27700	R27800	R27900	R28000	R28100	R28200	R28300	R28400	R28500	R28600	R28700	R28800	R28900	R29000	R29100	R29200	R29300	R29400	R29500	R29600	R29700	R29800	R29900	R30000	R31000	R32000	R33000	R34000	R35000	R36000	R37000	R38000	R39000	R40000	R41000	R42000	R43000	R44000	R45000	R46000	R47000	R48000	R49000	R50000	R51000	R52000	R53000	R54000	R55000	R56000	R57000	R58000	R59000	R60000	R61000	R62000	R63000	R64000	R65000	R66000	R67000	R68000	R69000	R70000	R71000	R72000	R73000	R74000	R75000	R76000	R77000	R78000	R79000	R80000	R81000	R82000	R83000	R84000	R85000	R86000	R87000	R88000	R89000	R90000	R91000	R92000	R93000	R94000	R95000	R96000	R97000	R98000	R99000	R100000	R101000	R102000	R103000	R104000	R105000	R106000	R107000	R108000	R109000	R110000	R111000	R112000	R113000	R114000	R115000	R116000	R117000	R118000	R119000	R120000	R121000	R122000	R123000	R124000	R125000	R126000	R127000	R128000	R129000	R130000	R131000	R132000	R133000	R134000	R135000	R136000	R137000	R138000	R139000	R140000	R141000	R142000	R143000	R144000	R145000	R146000	R147000	R148000	R149000	R150000	R151000	R152000	R153000	R154000	R155000	R156000	R157000	R158000	R159000	R160000	R161000	R162000	R163000	R164000	R165000	R166000	R167000	R168000	R169000	R170000	R171000	R172000	R173000	R174000	R175000	R176000	R177000	R178000	R179000	R180000	R181000	R182000	R183000	R184000	R185000	R186000	R187000	R188000	R189000	R190000	R191000	R192000	R193000	R194000	R195000	R196000	R197000	R198000	R199000	R200000	R201000	R202000	R203000	R204000	R205000	R206000	R207000	R208000	R209000	R210000	R211000	R212000	R213000	R214000	R215000	R216000	R217000	R218000	R219000	R220000	R221000	R222000	R223000	R224000	R225000	R226000	R227000	R228000	R229000	R230000	R231000	R232000	R233000	R234000	R235000	R236000	R237000	R238000	R239000	R240000	R241000	R242000	R243000	R244000	R245000	R246000	R247000	R248000	R249000	R250000	R251000	R252000	R253000	R254000	R255000	R256000	R257000	R258000	R259000	R260000	R261000	R262000	R263000	R264000	R265000	R266000	R267000	R268000	R269000	R270000	R271000	R272000	R273000	R274000	R275000	R276000	R277000	R278000	R279000	R280000	R281000	R282000	R283000	R284000	R285000	R286000	R287000	R288000	R289000	R290000	R291000	R292000	R293000	R294000	R295000	R296000	R297000	R298000	R299000	R300000	R310000	R320000	R330000	R340000	R350000	R360000	R370000	R380000	R390000	R400000	R410000	R420000	R430000	R440000	R450000	R460000	R470000	R480000	R490000	R500000	R510000	R520000	R530000	R540000	R550000	R560000	R570000	R580000	R590000	R600000	R610000	R620000	R630000	R640000	R650000	R660000	R670000	R680000	R690000	R700000	R710000	R720000	R730000	R740000	R750000	R760000	R770000	R780000	R790000	R800000	R810000	R820000	R830000	R840000	R850000	R860000	R870000	R880000	R890000	R900000	R910000	R920000	R930000	R940000	R950000	R960000	R970000	R980000	R990000	R1000000	R1010000	R1020000	R1030000	R1040000	R1050000	R1060000	R1070000	R1080000	R1090000	R1100000	R1110000	R1120000	R1130000	R1140000	R1150000	R1160000	R1170000	R1180000	R1190000	R1200000	R1210000	R1220000	R1230000	R1240000	R1250000	R

HCM Signalized Intersection Capacity Analysis

8: Oak Park Boulevard & James Way

3/27/2009



THE SECOND SECTION			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

C Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009



Movement	N	S	E	W	LT	RT	T	UT	NLT	SLT	GR
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor					1.00	0.95	0.95	1.00	0.95	1.00	0.95
Frt					1.00	0.87	0.85	1.00	0.95	1.00	0.93
Frt Protected					0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)					1770	1545	1504	1770	3379	1770	3278
Frt Permitted					0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)					1770	1545	1504	1770	3379	1770	3278
Volume (vph)	0	0	0	115	18	208	212	367	158	78	265
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	125	20	226	230	399	172	85	288
RTOR Reduction (vph)	0	0	0	0	79	82	0	87	0	0	199
Lane Group Flow (vph)	0	0	0	125	52	33	230	484	0	85	369
Turn Type					Perm	Perm	Prot			Prot	
Protected Phases					8		5	2		1	6
Permitted Phases					8		8				
Actuated Green, G (s)					16.0	16.0	16.0	11.0	21.0	6.0	16.0
Effective Green, g (s)					16.0	16.0	16.0	11.0	21.0	6.0	16.0
Actuated g/C Ratio					0.29	0.29	0.29	0.20	0.38	0.11	0.29
Clearance Time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)					515	449	438	354	1290	193	954
v/s Ratio Prot					0.03		c0.13	c0.14		0.05	0.11
v/s Ratio Perm					c0.07		0.02				
v/c Ratio					0.24	0.12	0.08	0.65	0.38	0.44	0.39
Uniform Delay, d1					14.9	14.3	14.1	20.2	12.3	22.9	15.6
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2					1.1	0.5	0.3	8.9	0.8	7.1	1.2
Delay (s)					16.0	14.8	14.5	29.2	13.1	30.1	16.8
Level of Service					B	B	B	C	B	C	B
Approach Delay (s)	0.0					15.1			17.7		18.5
Approach LOS	A					B			B		B

Intersection Summary		HCM Level of Service		B	
HCM Average Control Delay	17.5				
HCM Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	55.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	43.7%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Oak Park Boulevard & El Camino Real

3/27/2009

	→	→	←	←	↑	↑	↑	↑	↑	↓	↓
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95
Fr _t	1.00	1.00	0.85	1.00	0.92		1.00	0.99		1.00	0.96
FIT Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1681	1707	1583	1770	1708		1770	3510		1770	3412
FIT Permitted	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1681	1707	1583	1770	1708		1770	3510		1770	3412
Volume (vph)	293	46	167	85	31	39	74	758	44	97	380
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	50	182	92	34	42	80	824	48	105	413
RTOR Reduction (vph)	0	0	143	0	33	0	0	6	0	0	40
Lane Group Flow (vph)	179	189	39	92	43	0	80	866	0	105	503
Turn Type	Split		Perm	Split			Prot			Prot	
Protected Phases	4	4		8	8		5	2		1	6
Permitted Phases			4								
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0		9.0	21.0		6.0	18.0
Effective Green, g (s)	16.0	16.0	16.0	16.0	16.0		9.0	21.0		6.0	18.0
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.12	0.28		0.08	0.24
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	359	364	338	378	364		212	983		142	819
v/s Ratio Prot	0.11	c0.11		c0.05	0.03		0.05	c0.25		c0.06	0.15
v/s Ratio Perm			0.02								
v/c Ratio	0.50	0.52	0.11	0.24	0.12		0.38	0.88		0.74	0.61
Uniform Delay, d ₁	26.0	26.1	23.8	24.5	23.8		30.4	25.8		33.7	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d ₂	4.9	5.2	0.7	1.5	0.7		5.1	11.2		28.9	3.4
Delay (s)	30.8	31.3	24.5	26.0	24.5		35.5	37.0		62.6	28.8
Level of Service	C	C	C	C	C		D	D		E	C
Approach Delay (s)		28.9			25.3			36.9			34.3
Approach LOS	C			C			D			C	
Intersection Summary											
HCM Average Control Delay	33.4		HCM Level of Service				C				
HCM Volume to Capacity ratio	0.60										
Actuated Cycle Length (s)	75.0		Sum of lost time (s)				16.0				
Intersection Capacity Utilization	53.7%		ICU Level of Service				A				
Analysis Period (min)	15										
c Critical Lane Group											

HCM Unsigned Intersection Capacity Analysis 3: Oak Park Boulevard & LRDM

3/27/2009



Volume Total	2	1	17	26	13	326	7	364
Volume Left	2	0	0	24	13	0	7	0
Volume Right	0	0	17	1	0	39	0	2
cSH	353	344	682	344	1194	1700	1234	1700
Volume to Capacity	0.01	0.00	0.03	0.08	0.01	0.19	0.01	0.21
Queue Length 95th (ft)	0	0	2	6	1	0	0	0
Control Delay (s)	15.3	15.5	10.4	16.3	8.0	0.0	7.9	0.0
Lane LOS	C	C	B	C	A		A	
Approach Delay (s)	11.2			16.3	0.3		0.1	
Approach LOS	B			C				

Average Delay	1.1		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
8: Oak Park Boulevard & James Way

3/27/2009

Movement	EBL	EBR	EBR	WBL	WBR	WBL	WBR	NBL	NBR	SBL	SBR	SBL	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	0.95			1.00	0.95
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.93			1.00	0.97
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1827			1770	3280			1770	3447
Flt Permitted	0.71	1.00	1.00	0.65	1.00			0.95	1.00			0.95	1.00
Satd. Flow (perm)	1324	1863	1583	1216	1827			1770	3280			1770	3447
Volume (vph)	129	152	197	139	57	8	151	222	212	41	349	74	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	165	214	151	62	9	164	241	230	45	379	80	
RTOR Reduction (vph)	0	0	167	0	7	0	0	117	0	0	33	0	
Lane Group Flow (vph)	140	165	47	151	64	0	164	354	0	45	426	0	
Turn Type	Perm	Perm	Perm				Prot			Prot			
Protected Phases		4			8			5	2			1	6
Permitted Phases	4		4	8									
Actuated Green, G (s)	11.0	11.0	11.0	11.0	11.0			8.4	24.5			2.5	18.6
Effective Green, g (s)	11.0	11.0	11.0	11.0	11.0			8.4	24.5			2.5	18.6
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22			0.17	0.49			0.05	0.37
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	291	410	348	268	402			297	1607			89	1282
v/s Ratio Prot		0.09			0.04			c0.09	0.11			0.03	c0.12
v/s Ratio Perm	0.11		0.03	c0.12									
v/c Ratio	0.48	0.40	0.14	0.56	0.16			0.55	0.22			0.51	0.33
Uniform Delay, d1	17.0	16.7	15.7	17.4	15.8			19.1	7.3			23.1	11.3
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00			1.00	1.00
Incremental Delay, d2	1.3	0.6	0.2	2.7	0.2			2.2	0.3			4.5	0.7
Delay (s)	18.3	17.3	15.9	20.1	15.9			21.3	7.6			27.6	11.9
Level of Service	B	B	B	C	B			C	A			C	B
Approach Delay (s)		17.0			18.7			11.1				13.3	
Approach LOS		B			B			B				B	
HCM Average Control Delay		14.2				HCM Level of Service			B				
HCM Volume to Capacity ratio		0.45											
Actuated Cycle Length (s)		50.0				Sum of lost time (s)			12.0				
Intersection Capacity Utilization		49.4%				ICU Level of Service			A				
Analysis Period (min)		15											
c = Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009



Wt/veh/ln	EV	SPD/H	DEP	WTR	WMEV	WMEV	WTR	WMEV	WTR	WMEV	WTR	SHR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor				1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Frt				1.00	0.88	0.85	1.00	0.93	1.00	0.96	1.00	0.96
Flt Protected				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)				1770	1563	1504	1770	3291		1770	3412	
Flt Permitted				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)				1770	1563	1504	1770	3291		1770	3412	
Volume (vph)	0	0	0	367	38	284	218	506	445	116	630	199
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	399	41	309	237	550	484	126	685	216
RTOR Reduction (vph)	0	0	0	0	102	119	0	264	0	0	50	0
Lane Group Flow (vph)	0	0	0	399	82	47	237	770	0	126	851	0
Turn Type				Perm		Perm		Prot		Prot		
Protected Phases					8			5	2		1	6
Permitted Phases					8			8				
Actuated Green, G (s)				17.0	17.0	17.0	11.0	24.0		7.0	20.0	
Effective Green, g (s)				17.0	17.0	17.0	11.0	24.0		7.0	20.0	
Actuated g/C Ratio				0.28	0.28	0.28	0.18	0.40		0.12	0.33	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)				502	443	426	325	1316		207	1137	
v/s Ratio Prot					0.05		c0.13	c0.23		0.07	c0.25	
v/s Ratio Perm				c0.23		0.03						
v/c Ratio				0.79	0.18	0.11	0.73	0.59		0.61	0.75	
Uniform Delay, d1				19.9	16.3	15.9	23.1	14.1		25.2	17.8	
Progression Factor				1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2				12.3	0.9	0.5	13.4	1.9		12.6	4.5	
Delay (s)				32.1	17.2	16.4	36.5	16.0		37.8	22.3	
Level of Service				C	B	B	D	B		D	C	
Approach Delay (s)	0.0				25.0			19.8			24.2	
Approach LOS	A				C			B			C	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	66.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

15: Oak Park Boulevard & El Camino Real

3/27/2009



Movement	N	E	S	W	N	E	S	W	N	E	S	W	GR
Lane Configurations	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0				4.0	4.0			4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00				1.00	0.95			1.00
Frt	1.00	1.00	0.85	1.00	0.88				1.00	0.99			1.00
Flt Protected	0.95	0.99	1.00	0.95	1.00				0.95	1.00			0.95
Satd. Flow (prot)	1681	1750	1583	1770	1641				1770	3518			1770
Flt Permitted	0.95	0.99	1.00	0.95	1.00				0.95	1.00			0.95
Satd. Flow (perm)	1681	1750	1583	1770	1641				1770	3518			1770
Volume (vph)	408	271	417	51	13	71	68	827	35	102	810	222	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	443	295	453	55	20	77	74	899	38	111	880	241	
RTOR Reduction (vph)	0	0	283	0	71	0	0	3	0	0	23	0	
Lane Group Flow (vph)	359	379	170	55	26	0	74	934	0	111	1098	0	
Turn Type	Split		Perm	Split				Prot			Prot		
Protected Phases	4	4		8	8			5	2		1	6	
Permitted Phases			4										
Actuated Green, G (s)	21.4	21.4	21.4	7.0	7.0			4.0	37.0		8.6	41.6	
Effective Green, g (s)	21.4	21.4	21.4	7.0	7.0			4.0	37.0		8.6	41.6	
Actuated g/C Ratio	0.24	0.24	0.24	0.08	0.08			0.04	0.41		0.10	0.46	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	400	416	376	138	128			79	1446		169	1583	
v/s Ratio Prot	0.21	c0.22		c0.03	0.02			0.04	0.27		c0.06	c0.32	
v/s Ratio Perm			0.11										
v/c Ratio	0.90	0.91	0.45	0.40	0.20			0.94	0.65		0.66	0.69	
Uniform Delay, d1	33.2	33.4	29.3	39.5	38.9			42.9	21.2		39.3	19.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.0	23.8	0.9	1.9	0.8			79.2	2.2		8.9	2.5	
Delay (s)	55.2	57.2	30.2	41.4	39.7			122.1	23.5		48.1	21.7	
Level of Service	E	E	C	D	D			F	C		D	C	
Approach Delay (s)			46.3		40.3				30.7		24.1		
Approach LOS			D		D				C		C		

Intersection Summary

HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c = Critical Lane Group

HCM Unsignedized Intersection Capacity Analysis
3: Oak Park Boulevard & LRDM

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Volume (veh/h)	23	9	153	41	10	0	243	316	18	2	292	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	10	166	45	11	0	264	343	20	2	317	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1218	1233	337	1208	1242	353	357			363		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1218	1233	337	1208	1242	353	357			363		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	93	76	54	92	100	78			100		
cM capacity (veh/h)	123	138	705	96	136	690	1202			1196		
Direction	Lane #	EB 1	EB 2	EB 3	WB 1	NB 1	NB 2	SB 1	SB 2			
Volume Total		25	10	166	55	264	363	2	357			
Volume Left		25	0	0	45	264	0	2	0			
Volume Right		0	0	166	0	0	20	0	39			
cSH		123	138	705	102	1202	1700	1196	1700			
Volume to Capacity		0.20	0.07	0.24	0.54	0.22	0.21	0.00	0.21			
Queue Length 95th (ft)		18	6	23	63	21	0	0	0			
Control Delay (s)		41.7	33.1	11.7	76.2	8.8	0.0	8.0	0.0			
Lane LOS		E	D	B	F	A		A				
Approach Delay (s)		16.4			76.2	3.7		0.0				
Approach LOS		C			F							

Intersection Summary

Average Delay	8.0
Intersection Capacity Utilization	50.5%
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis
3: Oak Park Boulevard & LRDM

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85		1.00		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583		1791		1770	1847		1770	1832	
Flt Permitted	0.87	1.00	1.00		0.76		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1615	1863	1583		1418		1770	1847		1770	1832	
Volume (vph)	23	9	153	41	10	0	243	316	18	2	292	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	10	166	45	11	0	264	343	20	2	317	39
RTOR Reduction (vph)	0	0	148	0	0	0	0	2	0	0	6	0
Lane Group Flow (vph)	25	10	18	0	56	0	264	361	0	2	350	0
Turn Type	Perm	Perm	Perm				Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	6.4	6.4	6.4		6.4		15.7	40.4		1.2	25.9	
Effective Green, g (s)	6.4	6.4	6.4		6.4		15.7	40.4		1.2	25.9	
Actuated g/C Ratio	0.11	0.11	0.11		0.11		0.26	0.67		0.02	0.43	
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	172	199	169		151		463	1244		35	791	
v/s Ratio Prot		0.01					c0.15	0.20		0.00	c0.19	
v/s Ratio Perm	0.02		0.01		c0.04							
v/c Ratio	0.15	0.05	0.10		0.37		0.57	0.29		0.06	0.44	
Uniform Delay, d1	24.3	24.1	24.2		24.9		19.2	4.0		28.8	12.0	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1	0.3		1.5		1.7	0.6		0.7	1.8	
Delay (s)	24.7	24.2	24.5		26.5		20.9	4.6		29.5	13.8	
Level of Service	C	C	C		C		C	A		C	B	
Approach Delay (s)	24.5			26.5			11.5			13.9		
Approach LOS	C			C			B			B		

Intersection Summary

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c - Critical Lane Group

HCM Signalized Intersection Capacity Analysis

8: Oak Park Boulevard & James Way

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗	↑ ↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92	1.00	0.96	1.00	1.00	1.00	0.98	1.00
Frt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1712	1770	3392	1770	3392	1770	3454	1770
Frt Permitted	0.64	1.00	1.00	0.73	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1192	1863	1583	1360	1712	1770	3392	1770	3392	1770	3454	1770
Volume (vph)	99	38	107	183	76	89	45	380	146	41	347	66
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	108	41	116	199	83	97	49	413	159	45	377	72
RTOR Reduction (vph)	0	0	78	0	65	0	0	73	0	0	29	0
Lane Group Flow (vph)	108	41	38	199	115	0	49	499	0	45	420	0
Turn Type	Perm	Perm	Perm				Prot			Prot		
Protected Phases	4			8			5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	18.0	18.0	18.0	18.0	18.0	18.0	7.0	18.0	7.0	18.0		
Effective Green, g (s)	18.0	18.0	18.0	18.0	18.0	18.0	7.0	18.0	7.0	18.0		
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.13	0.33	0.13	0.33		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	390	610	518	445	560	225	1110	225	1130			
v/s Ratio Prot	0.02			0.07		c0.03	c0.15		0.03	0.12		
v/s Ratio Perm	0.09		0.02	c0.15								
v/c Ratio	0.28	0.07	0.07	0.45	0.20	0.22	0.45	0.22	0.20	0.37		
Uniform Delay, d1	13.7	12.7	12.8	14.6	13.3	21.5	14.6	21.5	14.2			
Progression Factor	0.70	0.76	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.2	0.2	3.2	0.8	2.2	1.3	2.2	2.0	0.9		
Delay (s)	11.1	9.8	8.9	17.8	14.2	23.8	15.9	23.8	23.5	15.1		
Level of Service	B	A	A	B	B	C	B	C	B			
Approach Delay (s)	10.0			16.1		16.5		16.5		15.9		
Approach LOS	A			B		B		B		B		

Intersection Summary

HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009

Movement	E BL	E BT	E BR	W BL	W BT	W BR	N BL	N BT	N BR	S BL	S BT	S BR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor				1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	0.95
Frt				1.00	0.87	0.85	1.00	0.96	1.00	1.00	0.93	
Flt Protected				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)				1770	1541	1504	1770	3404		1770	3286	
Flt Permitted				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)				1770	1541	1504	1770	3404		1770	3286	
Volume (vph)	0	0	0	115	18	227	212	464	158	78	310	283
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	125	20	247	230	504	172	85	337	308
RTOR Reduction (vph)	0	0	0	0	87	88	0	61	0	0	218	0
Lane Group Flow (vph)	0	0	0	125	56	36	230	615	0	85	427	0
Turn Type				Perm		Perm	Prot			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8						
Actuated Green, G (s)				16.0	16.0	16.0	11.0	21.0		6.0	16.0	
Effective Green, g (s)				16.0	16.0	16.0	11.0	21.0		6.0	16.0	
Actuated g/C Ratio				0.29	0.29	0.29	0.20	0.38		0.11	0.29	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	515	448	438	354	1300				193	956		
v/s Ratio Prot				0.04		c0.13	c0.18			0.05	0.13	
v/s Ratio Perm				c0.07		0.02						
v/c Ratio				0.24	0.12	0.08	0.65	0.47		0.44	0.45	
Uniform Delay, d1				14.9	14.3	14.2	20.2	12.8		22.9	15.9	
Progression Factor				1.05	1.15	1.22	1.00	1.00		1.00	1.00	
Incremental Delay, d2				1.1	0.6	0.4	8.9	1.2		7.1	1.5	
Delay (s)				16.7	17.1	17.6	29.2	14.1		30.1	17.4	
Level of Service				B	B	B	C	B		C	B	
Approach Delay (s)	0.0				17.1			17.9			18.9	
Approach LOS	A			B			B				B	
Intersection Summary												
HCM Average Control Delay	18.1			HCM Level of Service			B					
HCM Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	55.0			Sum of lost time (s)			8.0					
Intersection Capacity Utilization	45.8%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
15: Oak Park Boulevard & El Camino Real

3/27/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓	↑	↑	↓	↑	↑	↑↓	↑↑	↑	↑↓	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Fr _t	1.00	1.00	0.85	1.00	0.91		1.00	0.99		1.00	0.96	
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1705	1583	1770	1694		1770	3512		1770	3408	
Flt Permitted	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1705	1583	1770	1694		1770	3512		1770	3408	
Volume (vph)	331	46	167	85	31	48	74	808	44	102	406	133
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	360	50	182	92	34	52	80	878	48	111	441	145
RTOR Reduction (vph)	0	0	144	0	44	0	0	4	0	0	32	0
Lane Group Flow (vph)	200	210	38	92	42	0	80	922	0	111	554	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	1	6
Permitted Phases			4									
Actuated Green, G (s)	21.0	21.0	21.0	16.0	16.0		10.0	35.0		12.0	37.0	
Effective Green, g (s)	21.0	21.0	21.0	16.0	16.0		10.0	35.0		12.0	37.0	
Actuated g/C Ratio	0.21	0.21	0.21	0.16	0.16		0.10	0.35		0.12	0.37	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	353	358	332	283	271		177	1229		212	1261	
v/s Ratio Prot	0.12	c0.12		c0.05	0.02		0.05	c0.26		c0.06	0.16	
v/s Ratio Perm			0.02									
v/c Ratio	0.57	0.59	0.12	0.33	0.16		0.45	0.75		0.52	0.44	
Uniform Delay, d1	35.4	35.6	32.0	37.2	36.2		42.4	28.6		41.3	23.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.5	6.9	0.7	3.0	1.2		8.1	4.2		9.0	1.1	
Delay (s)	41.9	42.5	32.7	40.2	37.4		50.5	32.9		50.3	24.8	
Level of Service	D	D	C	D	D		D	C		D	C	
Approach Delay (s)		39.3			38.9			34.3			28.9	
Approach LOS		D		D			C			C		

Intersection Summary

HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsigned Intersection Capacity Analysis 3: Oak Park Boulevard & LRDM

3/27/2009



HCM Signalized Intersection Capacity Analysis

3: Oak Park Boulevard & LRDM

3/27/2009

Movement	E-B	S-B	N-B	S-B	N-B	E-B	W-B	N-B	S-B	N-B	E-B	W-B	S-B
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00	0.85		0.99		1.00	0.98		1.00	1.00		1.00
Flt Protected	0.95	1.00	1.00		0.96		0.95	1.00		0.95	1.00		1.00
Satd. Flow (prot)	1770	1863	1583		1775		1770	1829		1770	1857		
Flt Permitted	1.00	1.00	1.00		1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1863	1863	1583		1853		1770	1829		1770	1857		
Volume (vph)	7	3	48	22	2	1	36	264	36	6	333	6	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	8	3	52	24	2	1	39	287	39	7	362	7	
RTOR Reduction (vph)	0	0	49	0	1	0	0	5	0	0	1	0	
Lane Group Flow (vph)	8	3	3	0	26	0	39	321	0	7	368	0	
Turn Type	Perm		Perm	Perm			Prot		Prot				
Protected Phases		4			8		5	2		1	6		
Permitted Phases	4		4	8									
Actuated Green, G (s)	2.8	2.8	2.8		2.8		2.8	34.4		0.8	32.4		
Effective Green, g (s)	2.8	2.8	2.8		2.8		2.8	34.4		0.8	32.4		
Actuated g/C Ratio	0.06	0.06	0.06		0.06		0.06	0.69		0.02	0.65		
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	104	104	89		104		99	1258		28	1203		
v/s Ratio Prot	0.00					c0.02	0.18			0.00	c0.20		
v/s Ratio Perm	0.00		0.00		c0.01								
V/c Ratio	0.08	0.03	0.03		0.25		0.39	0.26		0.25	0.31		
Uniform Delay, d1	22.4	22.3	22.3		22.6		22.8	3.0		24.3	3.9		
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.3	0.1	0.2		1.3		2.6	0.5		4.7	0.7		
Delay (s)	22.7	22.4	22.5		23.9		25.4	3.4		29.0	4.5		
Level of Service	C	C	C		C		C	A		C	A		
Approach Delay (s)	22.5				23.9		5.8			5.0			
Approach LOS		C			C		A			A			
Intersection Summary													
HCM Average Control Delay		7.3				HCM Level of Service				A			
HCM Volume to Capacity ratio		0.28											
Actuated Cycle Length (s)		50.0				Sum of lost time (s)				8.0			
Intersection Capacity Utilization		39.3%				ICU Level of Service				A			
Analysis Period (min)		15											
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
8: Oak Park Boulevard & James Way

3/27/2009

Movement	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	S1	S2	S3	S4	S5
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	1863	1583	1770	1811	1770	3290	1770	3290	1770	3290	1770	3290	1770	3447	1770	3447
Flt Permitted	0.71	1.00	1.00	0.65	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1318	1863	1583	1216	1811	1770	3290	1770	3290	1770	3290	1770	3290	1770	3447	1770	3447
Volume (vph)	131	152	197	139	57	13	151	239	212	47	371	78					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	165	214	151	62	14	164	260	230	51	403	85					
RTOR Reduction (vph)	0	0	167	0	11	0	0	118	0	0	33	0					
Lane Group Flow (vph)	142	165	47	151	65	0	164	372	0	51	455	0					
Turn Type	Perm		Perm	Perm			Prot			Prot							
Protected Phases		4			8		5	2			1	6					
Permitted Phases	4		4	8													
Actuated Green, G (s)	11.0	11.0	11.0	11.0	11.0	11.0	8.5	24.4			2.6	18.5					
Effective Green, g (s)	11.0	11.0	11.0	11.0	11.0	11.0	8.5	24.4			2.6	18.5					
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.49			0.05	0.37					
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0					
Lane Grp Cap (vph)	290	410	348	268	398		301	1606			92	1275					
v/s Ratio Prot		0.09			0.04		c0.09	0.11			0.03	c0.13					
v/s Ratio Perm	0.11		0.03	c0.12													
v/c Ratio	0.49	0.40	0.14	0.56	0.16		0.54	0.23			0.55	0.36					
Uniform Delay, d1	17.0	16.7	15.7	17.4	15.8		19.0	7.4			23.1	11.4					
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	1.00					
Incremental Delay, d2	1.3	0.6	0.2	2.7	0.2		2.0	0.3			7.1	0.8					
Delay (s)	18.3	17.3	15.9	20.1	16.0		21.0	7.7			30.2	12.2					
Level of Service	B	B	B	C	B		C	A			C	B					
Approach Delay (s)		17.0			18.7			11.1				13.9					
Approach LOS		B			B			B				B					
Intersection Summary																	
HCM Average Control Delay			14.3			HCM Level of Service		B									
HCM Volume to Capacity ratio			0.46														
Actuated Cycle Length (s)			50.0			Sum of lost time (s)		12.0									
Intersection Capacity Utilization			50.1%			ICU Level of Service		A									
Analysis Period (min)			15														
c Critical Lane Group																	

HCM Signalized Intersection Capacity Analysis
12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009



Movement	EBL	EBR	EFL	EBR	NBL	NBR	NBL	NBR	NBL	NBR	NBL	NBR	SBBL	SBFR
Lane Configurations														
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	4.0	4.0
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor					1.00	0.95	0.95	1.00	0.95		1.00	0.95		
Fr _t					1.00	0.88	0.85	1.00	0.93		1.00	0.96		
Filt Protected					0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)					1770	1563	1504	1770	3294		1770	3410		
Filt Permitted					0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (perm)					1770	1563	1504	1770	3294		1770	3410		
Volume (vph)	0	0	0	367	38	287	218	520	445	116	644	207		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	399	41	312	237	565	484	126	700	225		
RTOR Reduction (vph)	0	0	0	0	104	120	0	257	0	0	0	51	0	
Lane Group Flow (vph)	0	0	0	399	82	47	237	792	0	126	874	0		
Turn Type					Perm	Perm	Prot					Prot		
Protected Phases					8	8	5	2				1	6	
Permitted Phases					8	8								
Actuated Green, G (s)	17.0	17.0	17.0	11.0	24.0							7.0	20.0	
Effective Green, g (s)	17.0	17.0	17.0	11.0	24.0							7.0	20.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.18	0.40							0.12	0.33	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0							4.0	4.0	
Lane Grp Cap (vph)	502	443	426	325	1318							207	1137	
v/s Ratio Prot			0.05	c0.13	c0.24							0.07	c0.26	
v/s Ratio Perm		c0.23	0.03											
v/c Ratio	0.79	0.19	0.11	0.73	0.60							0.61	0.77	
Uniform Delay, d1	19.9	16.3	15.9	23.1	14.2							25.2	17.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00							1.00	1.00	
Incremental Delay, d2	12.3	0.9	0.5	13.4	2.0							12.6	5.0	
Delay (s)	32.1	17.2	16.4	36.5	16.3							37.8	22.9	
Level of Service		C	B	B	D	B						D	C	
Approach Delay (s)	0.0		25.0		20.0							24.7		
Approach LOS	A		C		B							C		

Intersection Summary		HCM Level of Service		ICU Level of Service	
HCM Average Control Delay	22.8				C
HCM Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	66.8%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

15: Oak Park Boulevard & El Camino Real

3/27/2009

Movement	EPL	PERP	PERP	WEI	WEI	WEI	WEI	WEI	WEI	NET	NET	NET	SPL	SPL	SPL	SPL
Lane Configurations																
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0					4.0	4.0		4.0	4.0		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00					1.00	0.95		1.00	0.95		
Frt	1.00	1.00	0.85	1.00	0.88					1.00	0.99		1.00	0.97		
Flt Protected	0.95	0.99	1.00	0.95	1.00					0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1681	1750	1583	1770	1640					1770	3518		1770	3424		
Flt Permitted	0.95	0.99	1.00	0.95	1.00					0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1681	1750	1583	1770	1640					1770	3518		1770	3424		
Volume (vph)	412	273	416	48	18	73	68	834	35	105	818	226				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	418	297	452	52	20	79	74	907	38	114	869	246				
RTOR Reduction (vph)	0	0	199	0	73	0	0	3	0	0	22	0				
Lane Group Flow (vph)	363	382	253	52	26	0	74	942	0	114	1113	0				
Turn Type	Split	pm+ov	Split					Prot			Prot					
Protected Phases	4	4	5	8	8			5	2		1	6				
Permitted Phases			4													
Actuated Green, G (s)	22.3	22.3	27.3	7.0	7.0			5.0	40.7		9.0	44.7				
Effective Green, g (s)	22.3	22.3	27.3	7.0	7.0			5.0	40.7		9.0	44.7				
Actuated g/C Ratio	0.23	0.23	0.29	0.07	0.07			0.05	0.43		0.09	0.47				
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0				
Lane Grp Cap (vph)	395	411	522	130	121			93	1507		168	1611				
v/s Ratio Prot	0.22	c0.22	0.03	c0.03	0.02			0.04	0.27		c0.06	c0.32				
v/s Ratio Perm			0.13													
v/c Ratio	0.92	0.93	0.49	0.40	0.21			0.80	0.63		0.68	0.69				
Uniform Delay, d1	35.5	35.6	28.0	42.0	41.4			44.5	21.2		41.6	19.7				
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00				
Incremental Delay, d2	25.9	27.1	0.7	2.0	0.9			36.1	2.0		10.4	2.5				
Delay (s)	61.3	62.7	28.7	44.0	42.3			80.6	23.2		52.0	22.2				
Level of Service	E	E	C	D	D			F	C		D	C				
Approach Delay (s)		49.5			42.9				27.3			24.9				
Approach LOS		D			D				C			C				
Intersection Summary																
HCM Average Control Delay			34.5			HCM Level of Service						C				
HCM Volume to Capacity ratio			0.74													
Actuated Cycle Length (s)			95.0			Sum of lost time (s)						16.0				
Intersection Capacity Utilization			71.0%			ICU Level of Service						C				
Analysis Period (min)			15													
c = Critical Lane Group																

HCM Signalized Intersection Capacity Analysis

3: Oak Park Boulevard & LRDM

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↙	↖ ↙	↖ ↘	↖ ↗	↑ ↙	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↗ ↙
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583		1793		1770	1847		1770	1828	
Flt Permitted	0.85	1.00	1.00		0.77		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1575	1863	1583		1431		1770	1847		1770	1828	
Volume (vph)	35	8	209	41	12	0	243	316	18	2	292	41
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	9	227	45	13	0	264	343	20	2	317	45
RTOR Reduction (vph)	0	0	197	0	0	0	0	2	0	0	7	0
Lane Group Flow (vph)	38	9	30	0	58	0	264	361	0	2	355	0
Turn Type	Perm		Perm	Perm			Prot		Prot			
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	7.8	7.8	7.8		7.8		15.7	39.0		1.2	24.5	
Effective Green, g (s)	7.8	7.8	7.8		7.8		15.7	39.0		1.2	24.5	
Actuated g/C Ratio	0.13	0.13	0.13		0.13		0.26	0.65		0.02	0.41	
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	205	242	206		186		463	1201		35	746	
v/s Ratio Prot		0.00				c0.15	0.20			0.00	c0.19	
v/s Ratio Perm	0.02		0.02	c0.04								
v/c Ratio	0.19	0.04	0.14		0.31		0.57	0.30		0.06	0.48	
Uniform Delay, d1	23.3	22.8	23.1		23.7		19.2	4.6		28.8	13.0	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1	0.3		1.0		1.7	0.6		0.7	2.2	
Delay (s)	23.7	22.9	23.5		24.6		20.9	5.2		29.5	15.2	
Level of Service	C	C	C	C	C	A	C	C	B			
Approach Delay (s)		23.5		24.6			11.8			15.3		
Approach LOS	C		C		B					B		

Intersection Summary

HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c - Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Oak Park Boulevard & James Way

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑↑	↑	↑	↑↑	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85	1.00	0.91	1.00	0.95	1.00	0.96	1.00	0.97	0.97
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1696	1770	3392	1770	3392	1770	3442	3442
Flt Permitted	0.60	1.00	1.00	0.73	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1123	1863	1583	1360	1696	1770	3392	1770	3392	1770	3442	3442
Volume (vph)	99	38	107	183	76	112	45	380	146	64	364	82
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	108	41	116	199	83	122	49	413	159	70	396	89
RTOR Reduction (vph)	0	0	78	0	82	0	0	73	0	0	35	0
Lane Group Flow (vph)	108	41	38	199	123	0	49	499	0	70	450	0
Turn Type	Perm	Perm	Perm				Prot	Prot				
Protected Phases	4	4	8				5	2			1	6
Permitted Phases	4	4	8									
Actuated Green, G (s)	18.0	18.0	18.0	18.0	18.0	18.0	7.0	18.0	7.0	18.0		
Effective Green, g (s)	18.0	18.0	18.0	18.0	18.0	18.0	7.0	18.0	7.0	18.0		
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.13	0.33	0.13	0.33		
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	368	610	518	445	555	555	225	1110	225	1126		
v/s Ratio Prot	0.02			0.07			0.03	c0.15	c0.04	c0.13		
v/s Ratio Perm	0.10	0.02	c0.15									
v/c Ratio	0.29	0.07	0.07	0.45	0.22	0.22	0.22	0.45	0.31	0.40		
Uniform Delay, d1	13.8	12.7	12.8	14.6	13.4	13.4	21.5	14.6	21.8	14.3		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	0.2	0.3	3.2	0.9	0.9	2.2	1.3	3.6	1.1		
Delay (s)	15.8	12.9	13.0	17.8	14.3	14.3	23.8	15.9	25.4	15.4		
Level of Service	B	B	B	B	B	B	C	B	C	B		
Approach Delay (s)	14.1			16.0			16.5		16.6			
Approach LOS	B			B			B		B			

Intersection Summary

HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor				1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Fr _t				1.00	0.89	0.85	1.00	0.94		1.00	0.95	
Flt Protected				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)				1770	1577	1504	1770	3342		1770	3360	
Flt Permitted				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)				1770	1577	1504	1770	3342		1770	3360	
Volume (vph)	0	0	0	194	36	213	364	441	259	94	423	215
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	211	39	232	396	479	282	102	460	234
RTOR Reduction (vph)	0	0	0	0	82	103	0	120	0	0	99	0
Lane Group Flow (vph)	0	0	0	211	60	26	396	641	0	102	595	0
Turn Type				Perm		Perm	Prot		Prot			
Protected Phases					8		5	2		1	6	
Permitted Phases					8		8					
Actuated Green, G (s)				12.1	12.1	12.1	16.7	28.8		7.1	19.2	
Effective Green, g (s)				12.1	12.1	12.1	16.7	28.8		7.1	19.2	
Actuated g/C Ratio				0.20	0.20	0.20	0.28	0.48		0.12	0.32	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)				357	318	303	493	1604		209	1075	
v/s Ratio Prot					0.04		c0.22	0.19		0.06	c0.18	
v/s Ratio Perm					c0.12		0.02					
v/c Ratio					0.59	0.19	0.09	0.80	0.40		0.49	0.55
Uniform Delay, d1					21.7	19.9	19.5	20.1	10.0		24.7	16.9
Progression Factor					1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2					2.6	0.3	0.1	9.2	0.7		1.8	2.1
Delay (s)					24.3	20.2	19.6	29.3	10.8		26.5	18.9
Level of Service				0.0		21.8		17.1			19.9	
Approach Delay (s)					C	C	B	C	B		C	B
Approach LOS				A		C		B			B	

Intersection Summary

HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c = Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Oak Park Boulevard & El Camino Real

3/27/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Fr _t	1.00	1.00	0.85	1.00	0.92		1.00	0.99		1.00	0.96	
Flt Protected	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1707	1583	1770	1717		1770	3510		1770	3398	
Flt Permitted	0.95	0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1707	1583	1770	1717		1770	3510		1770	3398	
Volume (vph)	283	46	167	85	31	34	74	751	44	94	409	149
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	308	50	182	92	34	37	80	816	48	102	445	162
RTOR Reduction (vph)	0	0	125	0	31	0	0	4	0	0	35	0
Lane Group Flow (vph)	174	184	57	92	40	0	80	860	0	102	572	0
Turn Type	Split		pm+ov	Split			Prot			Prot		
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	21.0	21.0	33.0	18.0	18.0		12.0	36.0		14.0	38.0	
Effective Green, g (s)	21.0	21.0	33.0	18.0	18.0		12.0	36.0		14.0	38.0	
Actuated g/C Ratio	0.20	0.20	0.31	0.17	0.17		0.11	0.34		0.13	0.36	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	336	341	558	303	294		202	1203		236	1230	
v/s Ratio Prot	0.10	c0.11	0.01	c0.05	0.02		0.05	c0.25		c0.06	0.17	
v/s Ratio Perm			0.02									
v/c Ratio	0.52	0.54	0.10	0.30	0.14		0.40	0.71		0.43	0.46	
Uniform Delay, d ₁	37.5	37.7	25.5	38.0	36.9		43.1	30.0		41.8	25.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d ₂	5.6	6.0	0.4	2.6	1.0		5.7	3.6		5.7	1.3	
Delay (s)	43.1	43.7	25.9	40.6	37.9		48.9	33.7		47.5	27.0	
Level of Service	D	D	C	D	D		D	C		D	C	
Approach Delay (s)		37.5			39.4			35.0			29.9	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Oak Park Boulevard & LRDM

3/27/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↓	↓	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85		0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583		1771		1770	1829		1770	1851	
Flt Permitted	0.93	1.00	1.00		0.89		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1733	1863	1583		1657		1770	1829		1770	1851	
Volume (vph)	11	2	105	22	1	1	165	264	36	6	333	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	2	114	24	1	1	179	287	39	7	362	16
RTOR Reduction (vph)	0	0	104	0	1	0	0	5	0	0	3	0
Lane Group Flow (vph)	12	2	10	0	25	0	179	321	0	7	375	0
Turn Type	Perm	Perm	Perm				Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	4.3	4.3	4.3		4.3		10.8	32.9		0.8	22.9	
Effective Green, g (s)	4.3	4.3	4.3		4.3		10.8	32.9		0.8	22.9	
Actuated g/C Ratio	0.09	0.09	0.09		0.09		0.22	0.66		0.02	0.46	
Clearance Time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	149	160	136		143		382	1203		28	848	
v/s Ratio Prot	0.00				c0.10	0.18				0.00	c0.20	
v/s Ratio Perm	0.01		0.01	c0.02								
v/c Ratio	0.08	0.01	0.07		0.18		0.47	0.27		0.25	0.44	
Uniform Delay, d1	21.0	20.9	21.0		21.2		17.1	3.5		24.3	9.2	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0	0.2		0.6		0.9	0.5		4.7	1.7	
Delay (s)	21.3	20.9	21.2		21.8		18.0	4.1		29.0	10.9	
Level of Service	C	C	C		C	B	A			C	B	
Approach Delay (s)		21.2			21.8		9.0				11.2	
Approach LOS		C			C	A					B	

Intersection Summary

HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		
c - Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Oak Park Boulevard & James Way

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑↑	↑↑	↑	↑↑	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt	1.00	1.00	0.85	1.00	0.96	1.00	0.94	1.00	0.94	1.00	0.98	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1785	1770	3344	1770	3344	1770	3454	1770
Flt Permitted	0.70	1.00	1.00	0.65	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1306	1863	1583	1216	1785	1770	3344	1770	3344	1770	3454	1770
Volume (vph)	127	152	197	139	57	22	151	363	212	53	420	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	165	214	151	62	24	164	395	230	58	457	87
RTOR Reduction (vph)	0	0	167	0	19	0	0	124	0	0	28	0
Lane Group Flow (vph)	138	165	47	151	67	0	164	501	0	58	516	0
Turn Type	Perm	Perm	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	4	4	4	8	5	2	1	1	1	1	1	6
Permitted Phases	4	4	8									
Actuated Green, G (s)	11.0	11.0	11.0	11.0	11.0	7.6	23.0	4.0	19.4			
Effective Green, g (s)	11.0	11.0	11.0	11.0	11.0	7.6	23.0	4.0	19.4			
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.15	0.46	0.08	0.39			
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	287	410	348	268	393	269	1538	142	1340			
v/s Ratio Prot	0.09	0.09	0.04	c0.09	c0.09	c0.09	c0.15	0.03	c0.15			
v/s Ratio Perm	0.11	0.03	c0.12									
v/c Ratio	0.48	0.40	0.14	0.56	0.17	0.61	0.33	0.41	0.38			
Uniform Delay, d1	17.0	16.7	15.7	17.4	15.8	19.8	8.6	21.9	11.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.6	0.2	2.7	0.2	3.9	0.6	1.9	0.8			
Delay (s)	18.3	17.3	15.9	20.1	16.0	23.7	9.1	23.8	11.8			
Level of Service	B	B	B	C	B	C	A	C	B			
Approach Delay (s)	17.0			18.6		12.2		13.0				
Approach LOS	B			B		B		B				

Intersection Summary

HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

12: Oak Park Boulevard & NB 101 On-Ramp

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor				1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Fr _t				1.00	1.00	0.85	1.00	0.93	1.00	0.97		
Filt Protected				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)				1770	1770	1504	1770	3292		1770	3416	
Filt Permitted				0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)				1770	1770	1504	1770	3292		1770	3416	
Volume (vph)	0	0	0	507	221	302	262	541	471	217	580	176
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	551	240	328	285	588	512	236	630	191
RTOR Reduction (vph)	0	0	0	0	0	48	0	262	0	0	47	0
Lane Group Flow (vph)	0	0	0	551	240	280	285	838	0	236	774	0
Turn Type				Perm		pm+ov	Prot			Prot		
Protected Phases					8	1	5	2		1	6	
Permitted Phases					8		8					
Actuated Green, G (s)				19.8	19.8	29.0	11.0	19.0		9.2	17.2	
Effective Green, g (s)				19.8	19.8	29.0	11.0	19.0		9.2	17.2	
Actuated g/C Ratio				0.33	0.33	0.48	0.18	0.32		0.15	0.29	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)				584	584	827	325	1042		271	979	
v/s Ratio Prot					0.14	0.05	c0.16	c0.25		0.13	0.23	
v/s Ratio Perm					c0.31		0.13					
v/c Ratio				0.94	0.41	0.34	0.88	0.80		0.87	0.79	
Uniform Delay, d1				19.6	15.6	9.6	23.8	18.8		24.8	19.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2				24.0	0.5	0.2	22.3	6.6		24.8	6.5	
Delay (s)				43.5	16.1	9.8	46.1	25.4		49.7	26.2	
Level of Service				D	B	A	D	C		D	C	
Approach Delay (s)				0.0		27.7			29.6		31.5	
Approach LOS				A		C			C		C	

Intersection Summary

HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c - Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Oak Park Boulevard & El Camino Real

3/27/2009



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt	1.00	1.00	0.85	1.00	0.88	1.00	0.99	1.00	1.00	1.00	0.99	1.00
Flt Protected	0.95	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1681	1750	1583	1770	1641	1770	3519	1770	3419	1770	3419	1770
Flt Permitted	0.95	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1681	1750	1583	1770	1641	1770	3519	1770	3419	1770	3419	1770
Volume (vph)	433	289	416	48	18	71	68	880	35	102	836	245
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	471	314	452	52	20	77	74	957	38	111	909	266
RTOR Reduction (vph)	0	0	248	0	71	0	0	2	0	0	24	0
Lane Group Flow (vph)	382	403	204	52	26	0	74	993	0	111	1151	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	1	6
Permitted Phases			4									
Actuated Green, G (s)	23.7	23.7	23.7	6.6	6.6		3.7	35.2		6.7	38.2	
Effective Green, g (s)	23.7	23.7	23.7	6.6	6.6		3.7	35.2		6.7	38.2	
Actuated g/C Ratio	0.27	0.27	0.27	0.07	0.07		0.04	0.40		0.08	0.43	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	452	470	425	132	123		74	1404		134	1481	
v/s Ratio Prot	0.23	c0.23		c0.03	0.02		c0.04	0.28		0.06	c0.34	
v/s Ratio Perm			0.13									
v/c Ratio	0.85	0.86	0.48	0.39	0.21		1.00	0.71		0.83	0.78	
Uniform Delay, d1	30.5	30.6	27.1	38.9	38.3		42.2	22.2		40.2	21.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	14.3	0.9	1.9	0.9		104.6	3.0		32.5	4.1	
Delay (s)	44.1	45.0	27.9	40.8	39.2		146.9	25.2		72.7	25.4	
Level of Service	D	D	C	D	D		F	C		E	C	
Approach Delay (s)		38.5			39.8			33.6			29.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	88.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c = Critical Lane Group			